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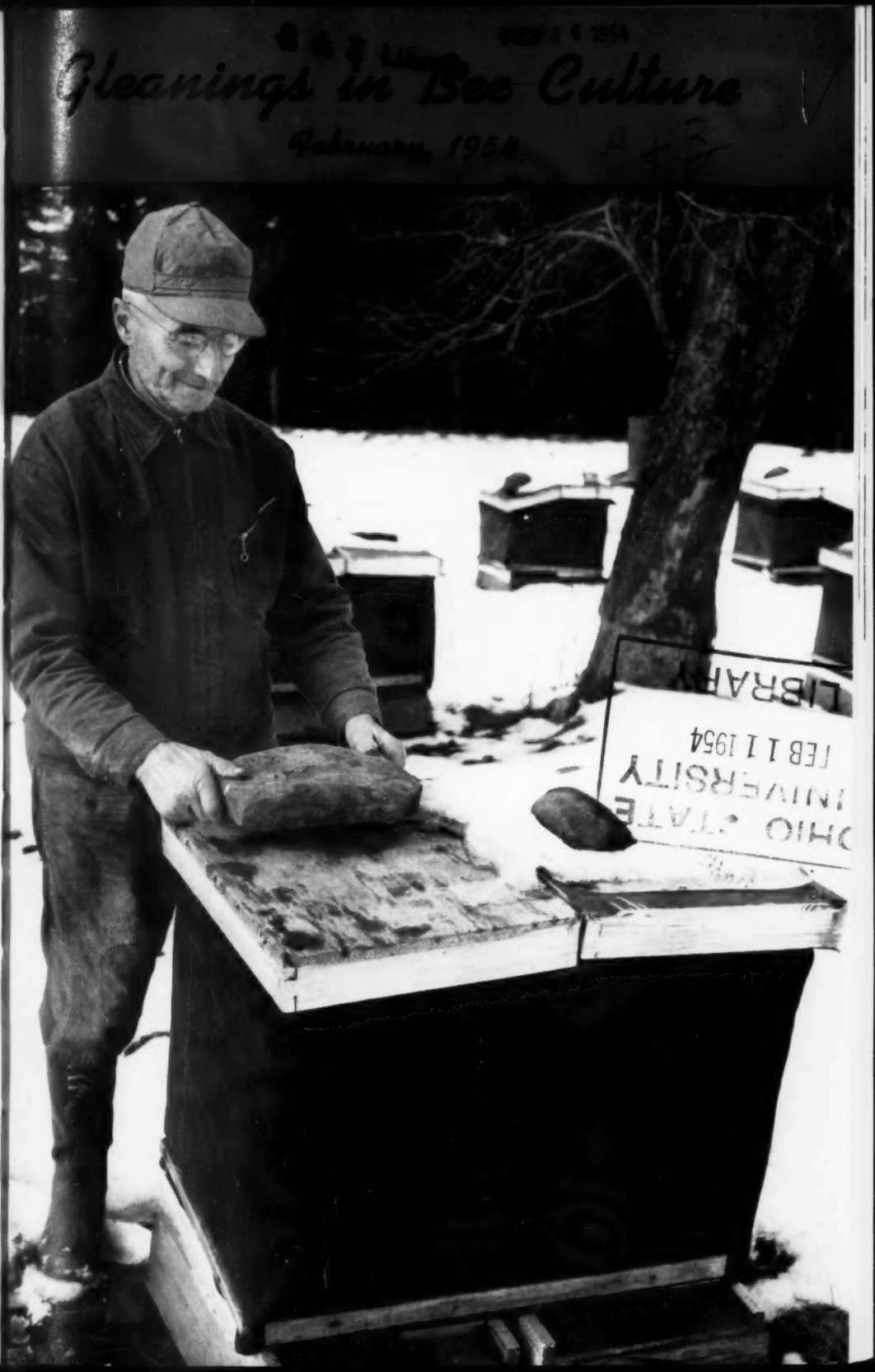
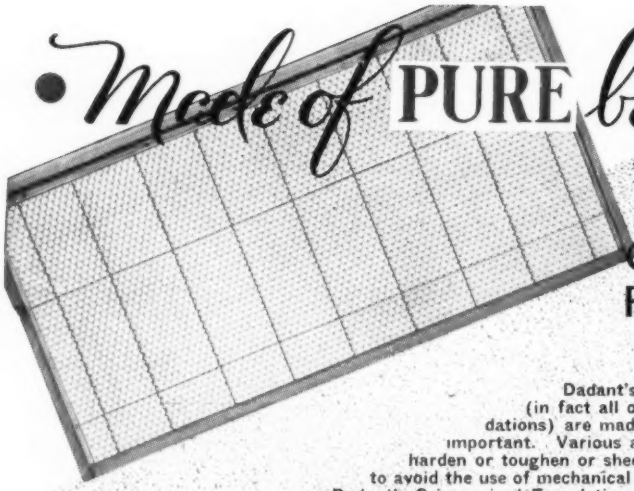


XUM

• Made of PURE beeswax



DADANT'S CRIMP-WIRED FOUNDATION

Dadant's Crimp-wired Foundation (in fact all of Dadant's Bee Comb Foundations) are made of pure beeswax. This is important. Various attempts have been made to harden or toughen or sheer up pure beeswax in order to avoid the use of mechanical supports such as are used in Dadant's Crimp-wired Foundation. However, remember beeswax is a basic raw material which goes into many products and has many uses.

Industry demands purity and refuses known mixtures. Remember, too, that the beeswax in comb honey whether in section or in bulk is actually a food because it is a part of the honey. Therefore, any mixing of other waxes with it is absolutely an adulteration.

Keep your beeswax safe for food use—worth the highest price on any market.

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- Milled to exact measures
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- Every sheet the same
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- Securely and safely wrapped

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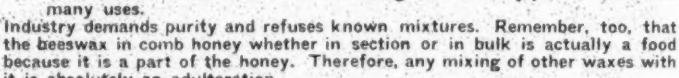

FIG. 1—Pure Beeswax; flecy flakes, thin bars

FIG. 2—½% carnauba wax; large, clear, bright burrs

FIG. 3—1% carnauba wax; smaller, bright burrs, tiny stars

FIG. 4—2% carnauba wax; large number burrs and stars

FIG. 5—5% carnauba wax; countless tiny brilliant crystals

COMPARATIVE MICROPHOTOS of Pure Beeswax and four stages of wax adulteration.

USED 32 YEARS -- STILL THE BEST

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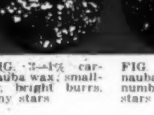
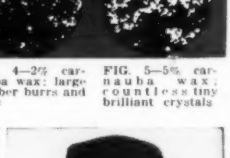
Chas. S. Engle, Beeville, Texas.





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1863 1953

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Gleanings in Bee Culture

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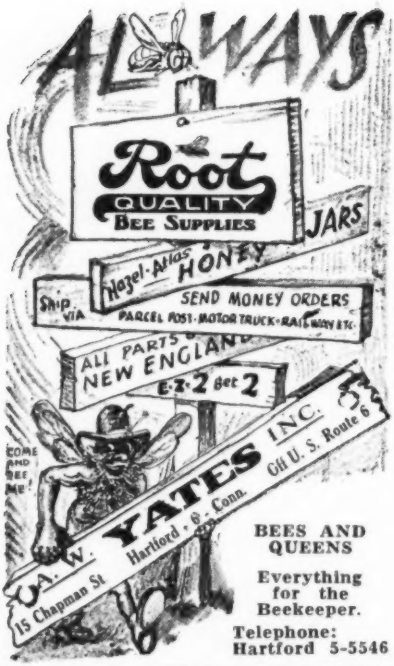

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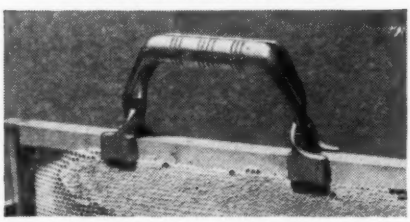

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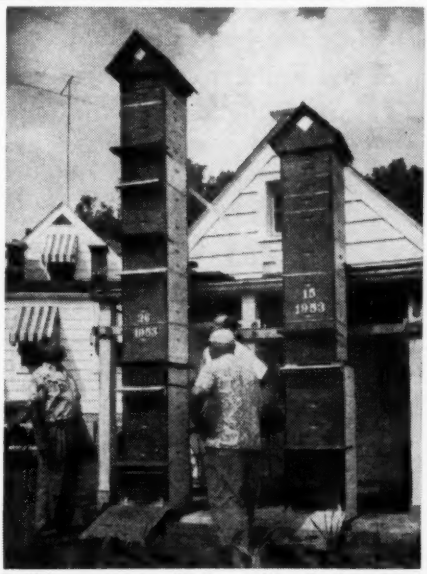

Build up your colonies with electric heat and get bigger yields. The hives in the above picture yielded 640 and 485 pounds respectively. No swarming if not desired, but swarming will not cut down yield. Think about it now. Write for information.

George Adelhardt, Libertyville, Ill.

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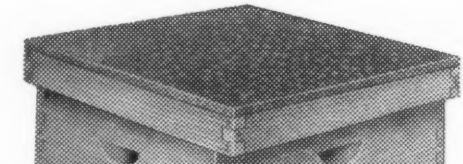

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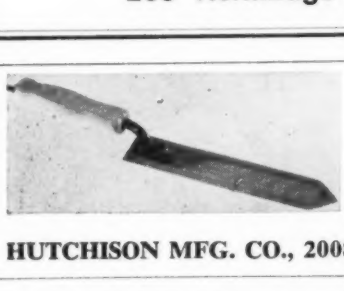

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Monthly HONEY Report

United States Market

The following figures represent an expression of current prices from beekeepers and honey packers over the country. They are based on several reports from each state averaged with the reports in the region. Where insufficient information is returned, prices have been omitted from the chart. Where three figures appear on the chart the first figure represents the low, the middle figure represents the average, and the third figure the high price in cents per pound. Where only two figures are used the low and high are shown.

	North & South Atlantic	South Central	North Central	Mid-West	West
Bulk Honey:					
Table Grade	11¼-13½-15c	15 16c	11-12-13c	12-12½-13c	11-12-14c
Baking Grade	9½-12-14	10-11-12	9-10-11	10½-11-11½	9½-10-11
Price to Grocers:					
5 lb. jar - can	19-22-28	20-24-26	18-19-21	17-18-20	18-19-22
2 lb. jar - 12's		23-25-26	22-25-26	21-24-25	22-23-25
1 lb. jar - 24's	23-25-30	23 25	22-26-29	21-24-25	23-25-27
Comb Honey: Cs. of 24 Sec.	$9-9.60-10		$7.20-8	$7.20-9	$9.60
Retail Price:					
60 lb. can	15-16-16½	16 20	15-16-22	16 17	15-16-20
5 lb. jar	20-28-35	25 30	20-22-25	20-24-26	22-25-30
2 lb. jar	27½-35-37	30-32½-33	27½-30-33	27½-31-33	29-30-33
1 lb. jar	29-35-45	33-35-39	30-32-33	30-33-35	30-35-39
Honey Sales:	Fair	Fair	Fair	Fair	Fair
Prospects for 1954	Good	Good	Poor	Fair	Fair

A few coments are as follows:

"Some moisture and snow may help drought conditions."—Vermont.

"There is no more honey in 60's or in drums in beekeepers hands. Only a few 5-pound pails here and there."—Northern New York.

"Very mild winter thus far."—Maine.

"Abnormally warm. Bees flying every day since first of the year."—Colorado.

"Honey moved slow during holidays."—Arkansas.

"Lack of snow cover here may be hard on legumes."—S. E. Minnesota.

"After holiday sales up."—Nebraska.

Canadian Market

(Unless otherwise specified, all quotations are for cases of No. 1 White.)

HALIFAX: Mkt. steady.
Ont., past., paper,
24/2's $12.50
24/1's 6.50

SAINT JOHN: Mkt. steady
Ont., past., glass,
24/16-oz. ..... $ 7.25
paper,
24/1's 6.10
24/2's 11.10
metal, 12/4's 11.50

MONTREAL: Mkt. firm.
Que., White, metal,
24/2's $10.75-11.50
12/4's 10.50-11.00
glass,
24/8-oz. ... 4.25- 4.50
24/16-oz. .. 6.25- 6.75
Dark, metal,
24/2's 6.50- 6.75

OTTAWA: Mkt. Steady.
Ont., past., metal,
24/2's $10.75-11.55
12/4's 9.90-10.65
paper, 24/1's 5.51- 5.80

TORONTO: Mkt. steady.
Ont., past.,
paper, 24/2's $ 9.75-10.50
metal, 24/2's 10.75-11.00
glass, 24/16-oz. 6.50- 6.75
unpast,
metal, 24/2's 10.75-11.50
glass, 24/16-oz. 6.25- 6.50

WINNIPEG: Mkt. steady.
Man., metal,
24/2's ..... $ 9.60
12/4's 9.05
past., paper,
48/1's 11.35
24/2's 10.50

REGINA: Mkt. steady.
Sask., past., paper,
48/1's $10.80-10.95
metal,
24/2's 10.60-10.80
12/4's 10.30-10.50
6/8's 10.20-10.40
unpast., metal,
12/4's 9.50-10.00

SASKATOON: Mkt. steady.
Sask., metal,
24/2's $10.15-10.25
12/4's 9.50- 9.75
past., paper,
48/1's 11.40-11.50
metal,
24/2's 11.20-11.30
12/4's 10.85-11.00

EDMONTON: Mkt. steady.
Alta., metal,
12/4's ..... $ 9.00- 9.60
past., paper,
48/1's 10.85-11.30
24/2's 10.30-10.75
metal,
12/4's 9.52-10.35
liquid, glass,
12/12-oz. 2.93- 3.35
B. C., liquid, glass,
12/1's 4.45- 4.85

CALGARY: Mkt. steady.
Alta., metal,
12/4's ..... $ 9.25
6/8's 8.50- 8.75
past., paper,
48/1's 10.50-11.00
24/2's 10.75
metal,
12/4's 9.25- 9.50

VANCOUVER: Mkt. steady.
Alta., past., carton,
24/1's ..... $ 5.65
24/2's 10.65
metal,
24/2's 11.20
12/4's 10.70
liquid, past., glass,
24/12-oz. 6.05

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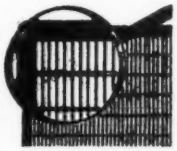

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- Allows maximum bee passage
- Better ventilation
- More honey production
- No wood. No Burr combs
- No sharp edges to injure bees
- So durably made that it is permanently queen excluding and will last a life time.

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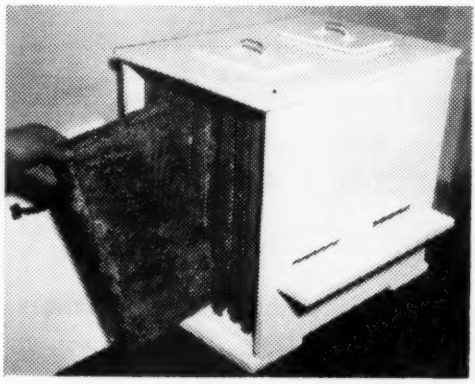

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THE STOVER APIARIES
Mayhew, Miss.

Honey in Candy Manufacturing

By W. H. Childs, Technical Editor
The Manufacturing Confectioner, Chicago, Illinois

In the large confectionery plants machinery has replaced hand labor to a great extent. The girls, shown above, are removing finished chocolates from the conveyor belt.

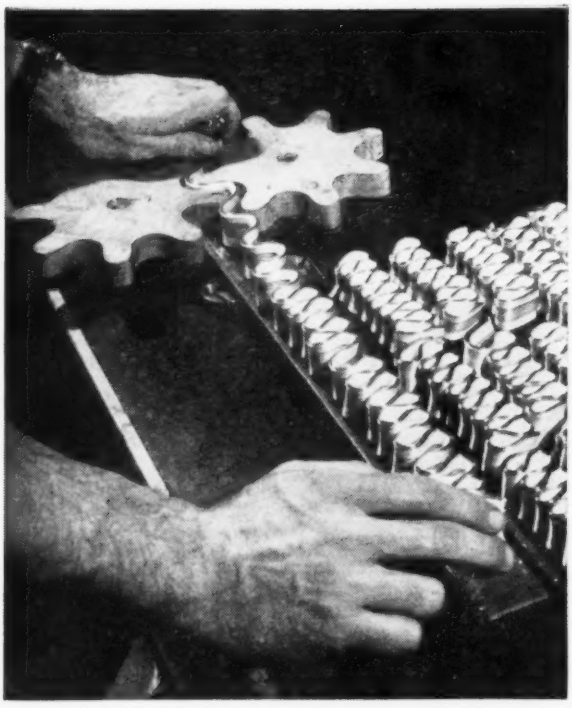
[This is the first of a series of articles on "Honey in Candy" by Mr. Childs.—Ed.]

Part I

"THE OLD ORDER changeth, yielding place to new . . . .," Tennyson might have been thinking about the confectionery industry when he penned those words. Records show that confectionery making dates back over 3500 years. Honey was one of the principle ingredients in those days when the candy maker was held in high esteem and deemed a very skillful craftsman.

With the advent of sugar, first, cane, and then beet, some honey was replaced in candies. Still later, when corn syrup and corn sugar entered the marts of commerce, more honey was replaced. Technological improvements in candy manufacturing such as continuous methods of processing demanded careful control and ingredients meeting rigid specifications. Mass production in the face of competition has further decreased the use of honey in the industry. For the most part, honey is used today in candy because of its flavor. Cost, a primary consideration in a highly competitive market, has reacted against the use of honey.

In 1950, nearly two billion pounds of sweeteners were used for the production of nearly three billion pounds of candy. The sweeteners consisted of: cane or beet sugar, corn sugar, corn syrup, molasses, invert sugar, honey, maple products, and other ingredients. However, less than one per cent of all ingredients used were attributed to



Here is another variation on the hand-made candy theme. This whirligig machine puts the crimp in candy just by pushing strips through these cogged wooden wheels.

molasses, honey, invert sugar, and maple products. In 1943, a war year, the last year in which complete figures on sweeteners were available, the confectionery industry used only 371 tons of honey, about 0.05 per cent of all ingredients.

Honey is a natural invert sugar and in common with corn syrup controls grain (crystal formation) in candy. A competitive product, standardized invert sugar, has met with great favor by candy makers because of cost and uniformity. This product is usually prepared from cane sugar through the action of acid and heat. Later, the acid is partially neutralized with soda.

A comparison of honey and commercial invert sugar may be of interest.

	Honey	Invert
Weight per gallon	11.8 lbs.	11.581 lbs.
Solids per gallon	9.6 lbs.	8.86 lbs.
Invert Sugar	75.0 %	76.5 %
Moisture	18.0 %	23.5 %
Ash	0.18%	0.075 %
pH	3.4-4.3	4.0-4.2

Commercial invert sugar contains levulose and dextrose in equal amounts. Honey contains about 40.5 per cent of levulose and 34.5 per cent of dextrose. Levulose is the important sugar in candy making: it does not dry out and crystallize. Dextrose is available commercially under various trade names. It, like cane or beet sugar, dries or crystallizes from saturated solutions.

The important difference between the products listed above, is in their acidity, indicated by pH. This term is not to be confused with the amount of acid present but may be considered as an intensity factor.

Grapefruit has a pH value of 3.0 to 3.3 and bananas of 4.5 to 4.7. On the pH scale, 7.0 indicates neutrality; figures higher indicate alkalinity; and figures lower than 7.0 indicate acidity.

The acidity or pH (acid intensity) must be considered in candy making. Adding acids at the start of the cooking process causes invert sugar to form which if not controlled will result in "sloppy" candy. The pH of honey varies as shown in the table and a candy maker in a large factory must know the correct amount of a grain retarder to use.

pH of Honey Must be Adjusted

IF HONEY is to increase in usage in candy manufacturing plants, a

CANDY SHOP LIKE GRANDMA HAD containing all the nostalgic charm of the candy shop where grandma and grandpa could buy a penny's worth of this and a penny's worth of that, this quaint Northampton, Mass., candy store has resisted all the charms of modern packing and design. Only the cellophane wrappings on the mint sticks give evidence of the day.—All photos from The Manufacturing Confectioner.

standardized type should be available. Adjustment of pH to 4.0 or 4.1 would enable the candy maker to substitute honey for commercial standardized invert sugar in his formulas, provided the cost were not prohibitive. Adjustment to a pH of 4.3 or 4.4 might cause precipitation of colloids present which would necessitate filtering the honey.

Chemical supply firms list colorimetric pH equipment with instructions at a nominal cost. Sodium bicarbonate is inexpensive and may be used to partially neutralize the honey to the correct acidity intensity. Only small amounts would be required but care in adding just enough to secure the end-point desired would be essential.

Addition of the soda in form of a 20 per cent solution, one part soda and four parts water, is suggested as an easy method to try. Such standardized honey should furnish an outlet for the honey producer who finds himself faced with a surplus.

Another important difference between honey and invert sugar is in the levulose content. As levulose is a non-graining sugar, and there is more present in honey than in invert sugar, slightly less honey should be needed

to accomplish the same results in candy making, namely, grain-retardation.

Corn syrup has more than gained a foot-hold in the candy field. It is low in price, and easy to handle besides being capable of retarding grain formation. Honey producers might say that the confectioner's type of corn syrup lacked flavor and they would be right. Flavor can be partially compensated by the addition of natural or artificial flavors added at the end of the candy making process. The flavor suppliers can really do marvellous things. They have a honey flavor that many confectioners use!

A criticism leveled at the candy producers who use excessive amounts or high percentages of corn syrup in their candies is that the candies so made, do not taste as good as those made where the sugar content is higher. Honey has long been noted for its sweetening powers. Candy made of sugar, corn syrup, and honey should be better than that made from just sugar and corn syrup.

There is Room for Small Honey Candy Makers

The confectionery industry is peculiar in that seemingly there is a place for the beginner. Huge, modern factories on one hand may turn out millions of pounds of candy, yet there are many small establishments making small 25 to 60 pound batches of candy, which are sold over the counter to their regular clientele.

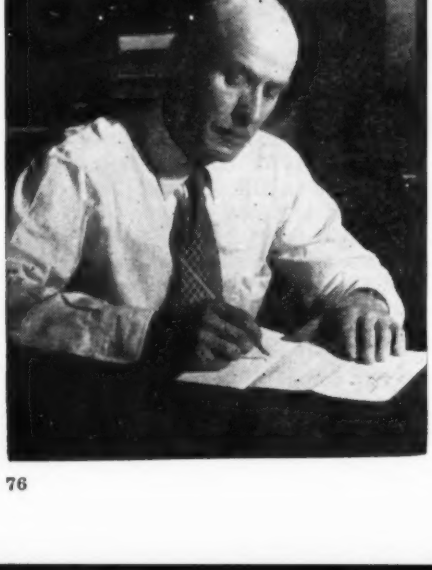
Some of these small enterprises grow and in time, branch out, to rather sizeable chains, operating from a "kitchen." Some of these operators started from scratch, with little knowledge other than a few recipes or formulas but with an overwhelming desire to succeed in their new venture.

Can Honey be Used in Candy?

Honey may be used in many types of candy. Perhaps, it is at its best in nougats or taffy but hard candy, butterscotch, caramels, and egg marshmallow are other uses where it is admirably fitted.

Many candy makers have found that **clover or orange blossom honeys** have ideal flavors and **are suitable for low cooked candies. Buckwheat honey is not suitable for candy making.** Producers of excess quantities of buckwheat honey could, if they desired, process it with activated carbon and filter, thereby removing the objectionable flavor and rendering the final product suitable for candy making. At the present time, it is somewhat questionable whether the treatment would be economically feasible.

(to be continued)



Dr. E. J. Dyce

Beekeeper Specialist Honored

DR. E. J. DYCE, professor of apiculture at Cornell, has been elected to honorary membership in the Bee Research Association of Great Britain. He is the second scientist in America to receive this honor for research in apiculture.

The Bee Research Association is probably best known for its work in editing the Magazine **Bee World,** which publishes abstracts in English of all the important scientific work carried on in beekeeping in the major honey-producing countries of the world. In addition to publishing books and pamphlets on apiculture, it also sponsored the National Beekeeping Museum which is housed in the Museum of English Rural Life at Reading, England.

Royal Jelly – Marvel Food – or What?

By R. B. Willson, New York, N. Y.

SOUTH OF THE BORDER—down Mexico way—as the song goes, there is great excitement over "Royal Jelly".

A physician in Mexico City is prescribing it for his patients and it is reported that he has a long line outside of his door each morning awaiting his services. The doctor, I am told, is paying $1,000 per kilo (2-1/5 lbs.) for the Royal Jelly, which is being supplied to him from two sources within his own country.

What is Royal Jelly?

Royal Jelly is a secretion from the pharyngeal glands of the young nurse bees fed exclusively to queens, and richer than the food fed to those bees which will develop into worker bees.

It is the great difference in what this food does to a tiny larva that would otherwise be destined to the life of the worker bee that is intriguing to biologists, physiologists, and medical men, because whereas the worker may live to be six weeks old in the height of the honey gathering season, a queen bee fed Royal Jelly may live to be six years old, and at frequent periods in her life is capable of laying her own weight in eggs in one day.

Much work has been done in Europe and Canada on the analysis of Royal Jelly. Its constituent parts, high in protein and fat, and relatively low in sugar as compared with honey itself, are well known, and all recent work done is in agreement that it is high in vitamin content. Some workers have made studies of Royal Jelly for hormone content and perhaps in a later issue we may be permitted to report these matters in detail, should there be sufficient interest to warrant it.

Let us take a look at the various claims that have been made for Royal Jelly taken in doses of from one to one and a half milligrams per day. They are listed, of course, without any substantiation whatsoever, and yet physicians and scientists with whom these claims have been discussed are unwilling to brush them off lightly because of the great importance that biological products are assuming in modern medicine.

R. B. Willson

Virtues of Royal Jelly

1) It produces a general state of well being.
2) It permits prolonged intellectual work without tiring.
3) It stimulates the appetite.
4) It normalizes the growth of under-developed children.
5) It gives rapid and effective relief to the suffering of women in their critical years.
6) It is credited with growing hair.
7) It eliminates a chronic feeling of tiredness, restoring to such people a feeling of vigor.
8) The length of the lives of experimental animals fed with Royal Jelly increased over 20 per cent.
9) Above all, it is credited with rejuvenating failing or worn-out glandular activities in human beings, creating and producing a feeling of youthfulness.

Other claims for Royal Jelly even more startling have been made, but the above gives a general idea of some of the things claimed for it.

The most recent opinion is that it is

Continued on page 125)

The O. A. C. Continuous Flow Honey Pasteurizer*

By G. F. Townsend,
Ontario Agricultural College,
Guelph, Ontario

HONEY CAN BE **continuously pasteurized, strained, and stabilized for liquid pack—or processed for fine-granulation in the same equipment and simultaneously.**

Honey is usually treated in batches and is either packed to be sold as liquid honey or is re-granulated according to the Dyce Process. Very little processing equipment has been designed specifically for honey and the bulk of the volume is handled in converted or modified dairy pasteurizers.

A continuous flow pasteurizer designed specifically for honey has now been developed and tested. This equipment is designed to incorporate simplicity of operation, compactness, and adaptability to any size or type of operation, at a relatively low cost.

Characteristics of Honey

Yeast spores are present in most honey samples and as the moisture content rises above 17 per cent the possibility of fermentation increases rapidly (1). Complete destruction of all yeasts can be achieved by heating the honey instantaneously to at least 151 degrees F. (2). Further heating to 170 degrees F. for five minutes or 180 degrees F. for two minutes will also delay crystallization in liquid honey for as much as 18 months (3). In addition, high temperatures greatly reduce honey viscosity and increase straining efficiency. For example, a white clover honey of 17.1 per cent moisture will flow more than 15 times as readily at 176 degrees F. than at 100 degrees F. (4). The specific heat of honey is important when determining the surface area necessary to heat a certain quantity of honey in a given time. The specific heat of liquid honeys will vary only slightly according to moisture content or source and for practical purposes can be accepted as .60 (5).

High quality honey must retain all of its delicate flavor and aroma, and should present a pleasing appearance to the customer. Granulated honey should have a smooth uniform texture which is attendant upon small crystals and rapid crystal formation. If the process of packing is not carefully controlled, re-granulated honey may break down during storage to a mush suspended in a liquid phase. Liquid honey should appear as a clear, sparkling product and should remain free of crystals and froth. A special straining procedure at a high temperature must be carried out to give liquid honey the desired clearness.

Liquid honey is a supersaturated solution of sugars and is in a physically unstable condition. Re-crystallization will take place unless it is retarded by a controlled heat treatment designed to break down the crystal nuclei without damaging the flavor or color of the product.

Heating

To minimize the time that the honey is held at a high temperature, rapid heat transfer is required for both heating and cooling. Conventional equipment is not satisfactory because of the high viscosity and the low heat transfer coefficient of honey.

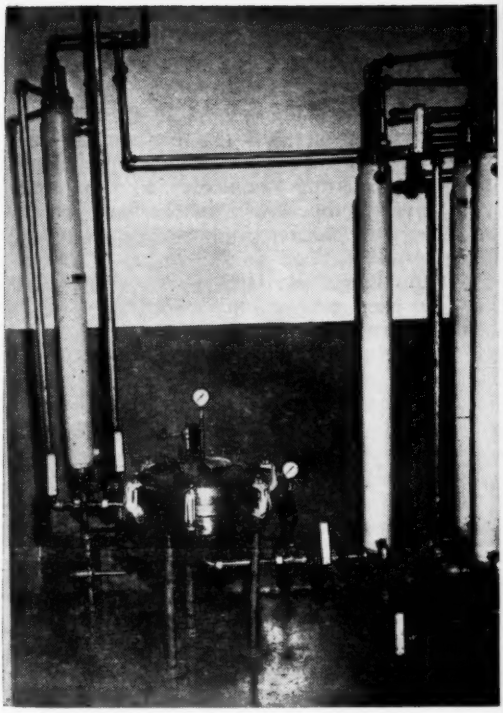
In the O.A.C. continuous flow honey pasteurizer the honey flows rapidly through a small annular passage and the actual heat transfer takes place through a maximum thickness of only 0.1 inch of honey. Such flash heating and cooling ensures that no portion of the honey will remain at a high temperature long enough to be damaged.

*This equipment was designed in cooperation with Mr. J. D. Hisey of Hisey & Barrington, Consulting Engineers, R. R. 4, Stouffville, Ontario, who are prepared to design similar units of any desired capacity.

The heat exchangers are identical whether for heating or cooling. They consist of two tubes placed one inside the other in order to provide a passage of not more than one-fourth inch between the two walls. It is in this passage that the honey flows.

The tubes are sealed at top and bottom with suitable inlets and outlets for water and honey. Standard tubing in stainless steel or copper of three inches to four inches diameter should be used. The length of the pipe should not exceed five feet. The length in this instance was four and one-half feet.

The honey is heated or cooled on the inside by passing the water or steam through the inner tube and on the outside by jacketing the outer tube. The heat exchangers are mounted in an upright position with the honey inlet at the bottom to avoid an air pocket. Steam should enter the top and water for either heating or cooling should enter the bottom of each heat exchanging unit.



O.A.C. continuous flow pasteurizer with honey strainer.—Photo courtesy Dept. of Public Relations, Ont. Agricultural College, Guelph, Ontario.

Straining

Straining is carried out while the honey is at its maximum temperature. This permits the use of a 200-mesh stainless steel screen fitted into a horizontal plate pressure strainer which is designed specifically for honey. At a temperature of 170 degrees F. very little pressure is built up and a high flow rate can be maintained.

Straining time coincides with the time interval required for pasteurization and stabilization for a liquid honey so that the honey is not injured by prolonged heating. The strainer is of simple construction and is easily cleaned and inspected, which serves to reduce maintenance and operating costs.

The strainer consists of a special plate filter designed to hold a strainer screen of approximately 10 inch diameter in the bottom. Provision is made to place several inches of silica sand over the screen. The sand must be sufficiently coarse so that it will not pass through the screen or block up the openings. The honey enters from the heater and passes down through the sand. Most of the coarser foreign particles are stopped by the sand layer and do not plug up the screen, which means that the strainer may be operated for long periods without cleaning. This strainer may be replaced by a pair of in-line filters if desired.

The sand strainer will also operate at lower temperatures and will overcome most of our present straining problems caused by granulated honey and clogging screens. A simple design is now underway for use in the honey house.

Cooling

After straining, the honey is cooled immediately in coolers of similar design to the heaters. A two-stage cooling unit is required to lower the honey to 75 degrees F., which is the optimum temperature for packing seeded honey. Liquid honey for bottling may be drawn off after the first cooling stage at a temperature of 100 to 120 degrees F.

The first cooling stage consists of one tube of the same size as the heating tube. The second stage of cooling consists of two of the same tubes in parallel.

Operation

In the pilot plant at the Ontario Agricultural College, the controls are operated manually, but in larger plants self-actuating controls to maintain preset temperatures of the honey leaving the heater and coolers may be installed. The whole system is closed and under pressure from holding tank to packaging machines so that no air is incorporated during processing. No vacuum is applied to the honey which can remove the delicate flavors and aroma.

The honey is pumped by an ordinary honey pump with reducing gears and a variable speed motor. In a larger plant it would be important to use a constant delivery pump to ensure a constant rate of flow through the equipment regardless of variations in the viscosity of the honey. This would permit the controls to be set correctly and left without further adjustment through the day's operation.

The honey entering the heater may be either liquid or semi-granulated, but should have been previously strained to remove most of the foreign material, particularly wax.

TO AVOID the necessity of using filter aids for bottled honeys, each batch of honey should be sampled and tested for sediment before being processed. The least turbid honeys, or those showing the least amount of sediment (usually pollen), should be used for bottling purposes. Those showing turbidity should be packed as a re-granulated honey.

Operating pressures do not rise above 25 p.s.i. and are usually lower. The pressure is almost totally built up by resistance in the cooling units. This causes little wear on the pump or stresses on other equipment and piping. Variations in moisture content do not significantly change the operating pressure.

For processed honey the pilot plant described will heat honey to 170 degrees F. and reduce it to 75 degrees F. in continuous flow at a rate of 275 pounds per hour.

For bottled honey it will heat the honey to 175 degrees F. and reduce it to 100 degrees F. at 450 pounds per hour. This capacity can be doubled by using two heating units in place of one.

The above capacities may be proportionately increased by increasing the number of heat exchangers.

Record of Operating Conditions

	Test No. 1 (For Seeding)	Test No. 2 (For Bottling)
Initial Honey Temperature	95°F.	80°F.
Honey Temperature at Heater Outlet	175°F.	175°F.
Honey Temperature at Strainer Outlet	165°F.	165°F.
Honey Temperature at Cooler Outlet		
First Stage	110°F.	125°F.
Second Stage	77°F.	104°F.
Honey Volume	275 lb./hr.	450 lb./hr.
Water in Cooling Units		
Rate of Flow	140 gal./hr.	100 gal./hr.
Temp. Inlet	60°F.	88°F.
Temp. Outlet	75°F.	-
Pressure	7 p.s.i.	7 p.s.i.

The honey used in this instance was of 17 per cent moisture.

The heating unit was operated with a light flow of steam.

The cooling unit was operated with tap water moderated in temperature by injecting a small amount of steam. The same flow of water was used for both cooling units. The water flowed first through the second cooling unit and then passed through the first unit before being discharged.

References:
(1) 1946 - Stephen, W. A. The relationship of moisture content and yeast count in honey fermentation. Sci. Agr. 26:6.
(2) 1939 - Townsend, G. F. Time and temperature in relation to the destruction of sugar-tolerant yeasts in honey. J. Econ. Ent. 32: 650-654.
(3) 1953 - Austin, G. H. Maintaining a high quality in liquid and re-crystallized honey. Can. Bee J. Vol. 61 No. 1 and unpublished information.
(4) 1943 - Munro, J. A. The viscosity and thixotrophy of honey. J. Econ. Ent. Vol. 36: 5.
(5) 1953 - MacNaughton, E. B. Department of Physics, O.A.C., Guelph, unpublished information.

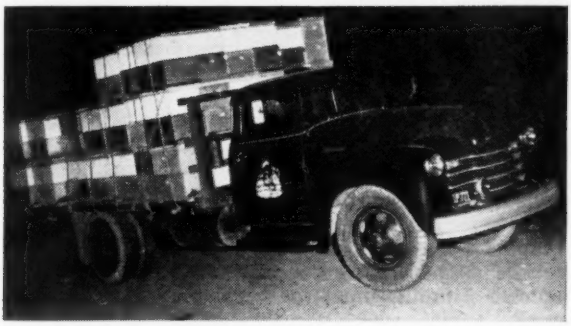
* * *

New York State Honey Week

Another Governor proclaimed a State Honey Week when Thomas E. Dewey of New York issued a proclamation on October 14, 1953. The following is an excerpt from his statement: "The use of the honeybee in the pollination of fruit orchards and field crops is, of course, in addition to the value of the bee in the production of honey as a food. Increasing recognition is being given to honey for its high energy and special food values."

Some Effects of Laughing Gas on Honey Bees

By J. E. Eckert*, University of California, Davis, Calif.



Experimental results indicated that moving bees to improve pollination is more effective than trying to make the bees forget their last source of nectar by gassing them.

REPORTS HAVE appeared in our beekeeping literature of the use of (laughing gas) nitrous oxide in connection with the moving of colonies of bees short distances and also in the introduction of queens. The gas is said to cause the bees to "forget" their orientation to a given hive site so that hives can be moved short distances without the bees returning to their former location as they normally would do.

Interest was created in the possibility of using nitrous oxide to cause colonies located in seed alfalfa fields to reorient their field operations in the hope that the bees might confine their work for several days to the seed alfalfa fields after being anaesthetised by the gas.

Beekeepers have also been searching for a quicker and less costly method of requeening a large number of colonies than by searching out and killing the old queens before introducing the new ones. It was thought that nitrous oxide might provide the medium for this operation.

Preparing Nitrous Oxide

Nitrous oxide can be produced and delivered by dropping a handful of the fertilizer, ammonium nitrate, onto well lighted smoker fuel in a bee smoker and puffing the resultant yellowish smoke into the entrance of a hive and between the hive bodies. This amount is enough to gas several colonies, if one works fast.

The effect of the gas was tried first on four colonies in the experimental apiary at Davis, and on five colonies near Mettler, before 220 colonies were anaesthetised in two widely separated alfalfa fields in the same Mettler area. The colonies were gassed near dusk. Some field bees were returning to their hives at the time and may not have been overcome by the fumes.

Determining Effects of Gas

In order to determine the effects on the orientation of the bees located in the alfalfa fields near Mettler, California, eight stations were staked off in each field in which counts of bees working on the blossoms were made at four different intervals on each of two days prior to the gassing of the bees and for two days thereafter. Counts were also made of the number of returning pollen bearers at representative hives and also of the percent of blossoms tripped.

At Davis, weight records of the amount of pollen collected by one hive at intervals over two days prior to the gassing of the bees was compared with the amount collected on the two days following. The source of the pollens was also determined. The effect of the

* Kenneth Tucker, graduate assistant, assisted with the observations on gassed colonies at Davis; Charles Reed, and about 20 other members of the Valley Pollination Service of California, not only contributed experimental colonies but assisted in the application of the nitrous oxide, in moving the hives and in making the observations. The owners of alfalfa seed fields used near Mettler deserve commendation for permitting the excess travel through their fields.

gas on the bees and brood was observed at all three locations.

General Effect of Nitrous Oxide on Bees

It was found that an entire colony of bees in a two-story hive would be overcome with fumes of the smoke almost immediately after they were enveloped in the fumes.

The smoke was applied by blowing three or four puffs in the entrance and between the first and second stories. One colony was gassed with nitrous oxide from a tank.

Each colony became quiet and devoid of movement or sound in from one to two minutes, without much regurgitation of honey, and then recovered slowly in from eight to ten minutes. However, they were subdued and disorganized for a much longer period.

The bees dropped from clusters on the outside of their hives and from between the combs, effectively blocking the entrance and shutting off all ventilation. Sometimes several dozens of bees were found dead in front of the entrances the following morning. They may have been injured by suffocation or when the second story was replaced after the application of the gas.

It was observed that the bees guarded their entrances diligently the morning following the application of the fumes but in all instances their activity afield was markedly reduced for the first 24 hours and did not approach normal until the afternoon of the second day.

The Orientation of the Gassed Bees

One colony at Davis collected 63.3 grams of pollen the day before it was anaesthetised and 18.8 grams the first day after and 64.2 grams the second day after being gassed. On the first day before being gassed, the pollens came from eight different sources and from 12 different sources the day following the treatment with nitrous oxide. The predominent amount of the pollens came from the same sources

During five minute periods beginning at 9:45, 1:30, and 5:49, one of the five colonies near Mettler had no pollen bees to return on the first day after gassing while a check colony, not gassed, had 26, 48, and 60 pollen bearers to return during the same periods.

Representative colonies among the 220 hives in the seed alfalfa fields were observed in regard to returning pollen bearers on the first and second days following the gassing.

The marked inactivity of the gassed colonies on the first day was indicated when 3, 16, and 1 pollen bearers were observed to return to three colonies during two five minute intervals in contrast to 76, 138 and 128 pollen bearers returning to the same colonies at approximately the same periods of time on the day preceding the application. On the second day after gassing, the number of returning pollen bearers to the same gassed colonies was 6, 43, and 60, with the largest number being on the last count in the afternoon.

THE COLORS of the pollens borne by the bees returning to the gassed hives indicated that the bees had reoriented their activities not only to alfalfa but also to cotton, fields of which occurred in the near vicinity of the alfalfa.

Counts of bees visiting the eight marked areas in each seed alfalfa field were as follows: 74 (32 & 47), 75 (33 & 57), 50 (29 & 43), 64 (31 & 54), in which the first numbers were for the day previous to the gassing and the numbers in parentheses were for the first and second days after. The per cent of blossoms tripped indicated a reduction during the two days after the bees were gassed when compared to the number tripped on the two preceding days.

Due to the fact that the fields were not isolated and that many other colonies were within flying distance of the fields, the counts of bees visiting the blossoms tripped can not be attributed directly to the effects of the application of the nitrous oxide.

Effect of Nitrous Oxide on Brood and Brood Rearing

No injury was noted to the brood or to the queens in the gassed colonies at Davis. As a further check, combs of unsealed brood were exposed to nitrous oxide and then returned to their hives. No injury resulted from the gassing. The temperature was 87 degrees F., at the time the colonies were gassed at Davis.

The brood in the five trial colonies

that were gassed at Mettler showed no apparent injury the morning after but by the afternoon of the first day, the unsealed brood appeared to have dried and by the following afternoon, most of the unsealed brood over two days of age was dead and in a dried condition. The queens were observed to be somewhat smaller in the abdomens, as if they had been reduced in size.

Brood in representative colonies among the 220 gassed hives showed varying stages of injury. In some, all unsealed brood was dried or absent by the second day, while in others, the younger brood and some of the older unsealed brood was injured. In a few colonies, the brood appeared normal.

The temperature at 5 o'clock on the day of the 220 colonies were gassed was around 103 degrees F., and the night temperature did not cool off as much as at Davis. The following day found temperatures again in the high 90's.

What queens were found in the 220 gassed colonies appeared to have reduced their egg laying activities during the 24 to 48 hours after the application of the gas but brood rearing appeared to be normal on the third day.

Reaction of Bees in Hives that were Moved

In order to contrast the effect of gassing bees with nitrous oxide with the orientation of bees from hives that were moved, a truck load of bees was exchanged from one field with another load taken from a distant field. Counts of bees at eight designated stations were taken over two days before and two days after the exchange. The number of pollen bees returning to representative colonies was also checked.

The first day after the hives were moved, 71 pollen bearers returned to one of the moved hives in contrast to 120 to a similar hive in the same area the day before. By the second day, the newly moved bees were gathering about the same amount of pollen as the other colonies had before they were moved.

The colors of the pollen carried by the bees indicated that they had oriented their activities to both alfalfa and to nearby fields of cotton. The field activities of the moved bees was appreciably more normal the day after the hives were moved to a new location than was the case of the bees that were gassed with nitrous oxide on their old locations.

Results of Introducing Queens*

In this test, five queens were introduced into as many queenright colonies. The colonies and the introduced queens were gassed with nitrous oxide fumes after dark and the colonies were not examined until two days later. In each case evidence indicated that the introduced queen had been killed and the original queen was still present.

Conclusions: Nitrous oxide fumes generated from ammonium nitrate in a bee smoker overcame the bees in the colonies in a minute or less with recovery of movement taking place in from eight to ten minutes.

Some bees were killed, probably by suffocation, the queens stopped laying for from one to three days, and unsealed brood was killed in a large proportion of hives exposed to hot temperatures during the day following the application of the gas. This injury apparently was due to the disorganized condition of the colonies.

The bees did not fully regain their normal activities for from one to three days and did not confine their pollen-gathering activities to the immediate surroundings of their hives but to the general area.

The attempt to introduce queens to queenright colonies resulted in failure with the gassing of both the colonies and the queens being introduced.

The reorientation of bees from moved colonies was far superior and with less injury to the colonies than resulted from the use of nitrous oxide.

It was apparent that nothing was gained by overcoming the colonies with nitrous oxide and that their disorganization resulted in a loss of nectar-gathering and pollinating services, as well as an ultimate reduction in colony strength through the loss of unsealed brood. The injury to the brood appeared to be associated with the extreme heat in the Mettler area as it did not occur in the colonies at Davis.

Nitrous oxide should be used with caution on strong colonies of bees, especially in hot weather.

* Clarence Ward provided the queens and originated the tests.

Honey Advertising and Promotion in Canada

By J. N. Dyment, Smithville, Ontario
Member of the Canadian Beekeepers' Council

BEEKEEPING IN CANADA and the U. S. A. is a business. It calls for the same shrewd management in every phase of it as is already common to the successful manufacturer. A manufacturer has two main purposes to accomplish—the production of a satisfactory article and the sales promotion of it in a field of competition.

Beekeeping, of course, involves great numbers of individuals, which all combined make up the marketable product of a country, province, or state. Some of these individuals are good salemen but probably more of them are not. Therefore, the reasonable necessity of a honey producing organization's efforts in bringing under one duly elected committee the responsibility of advertising and sales promotion of honey. The general recognition of this prime factor by any association is a decided accomplishment. It is, however, only the beginning.

How Should Funds be Raised?

Money has to be raised, and it should be wherever possible collected from the producers in an equitable manner. We learned this in Ontario a few years ago when we were asking the producers for voluntary contributions.

Yes, even infants can benefit by the use of honey in their diet. In fact, many doctors recommend honey as sweetening in baby's milk. Children love honey, so do grown-ups. It's delicious, digestible and nutritious. Add honey to your menus—see how it pleases everyone in your family.

Send for these FREE leaflets

They explain delightful recipes that use honey in new ways.

AMERICAN HONEY INSTITUTE
Dept. 00 Madison, Wis.

Canadians fully appreciate the American Honey Institute and make full use of the advertising literature prepared by that active organization.

I can remember on several occasions being one of a committee to appeal to the Government for assistance. It did not work out to our satisfaction as far as cash hand-outs were concerned. Our organization, however, along with other branches of agriculture, were appealing for legislation to enable us to lawfully collect an equitable levy on sales of containers.

Due to the cooperation of the Ontario Minister of Agriculture at that time, this legislation became a reality under the Farm Products Containers Act. This was our salvation and is now the backbone of the successful collection of finances for advertising and promotion of honey.

What I have related here so far has pertained to the Province of Ontario.

Our Canadian organization, known as The Canadian Beekeepers' Council, consists of two duly elected members from each province. Each of these provinces is a contributor to a pooled fund of Council, chiefly maintained for the advertising and promotion of our product.

WHILE ONTARIO is the only Province with a legislative levy, the

Council has an arrangement with the container companies, whereby the companies turn over to the Council the equitable one-fifth of a cent per pound, container capacity, from their sales in the other provinces. These cans are usually priced to the beekeeper with the inclusion of the one-fifth cent.

This levy is not a compulsory one, as far as legislation is concerned, but it is interesting to note that each year an investigation by the Council has shown the collections to be close to 95 per cent. This successful rate reflects credit upon the producers across Canada, who have come to realize:

1. The necessity of promoting the sales of honey.
2. The value of unity of purpose across Canada.
3. That some faith and tolerance must be exercised concerning those charged with the responsibility of spending the money.

Ontario at the present time collects one-third of a cent per pound, container capacity. The provincial equitable one-fifth goes to the Council, and we retain the balance for the operation of the provincial association and whatever advertising is possible with the balance of the funds.

Canadian Sports College

For three or four years now the Council has carried on concerted advertising campaigns to the limit of its resources. In the main, the energy giving properties of honey have been emphasized. To get this across in the most effective manner, we have worked through our Canadian Sports College, which recommends honey to be the most easily digested and quickest energy giving sweet for athletes.

It was the Sports College which introduced the eating of honey for energy by the Detroit Red Wings. We took advantage of their win of the Stanley Cup the year before last and publicized them as using honey for energy. A picture of the team was used, as well as insets of Howe and Kelly, both of whom made personal statements endorsing honey. Sports editors told us it was the most sensational ad they had ever seen.

Later on, the Peterborough Lacrosse team, which has won the Canadian championship Mann Cup several years in a row, was publicized in the same manner.

On Nov. 28th, 1953, the Hamilton Tiger-Cat Football team won the Canadian Championship Grey Cup. They were using honey on their training table and we publicized them as endorsing honey for energy. The popularity of football in Canada is tremendous, and we feel the advertising dollar in this one will go far.

OUR ARRANGEMENT with Sports College gains for us the more or less constant endorsement of honey for athletes in their monthly publication, **The Research Guide,** and on their weekly radio broadcasts. We are fortunate in this latter instance, since the Sports College through its own research has proven honey to be the superior sweet for athletes. Therefore, on their own behalf they refuse to recommend any other sweet.

Another feature which the Council believes to be valuable is its tie-up with the American Honey Institute, through its capable director, Mrs. Harriett M. Grace. Mrs. Grace is keeping our Canadian food editors well supplied with recipe material, and a most satisfactory amount appears in the numerous Canadian publications throughout the year.

As far as paid advertising itself is concerned, however, we believe the greatest single boon to sales has been the energy for sports theme. It is quite understandable that if we can associate honey with a club as popular as the Detroit Red Wings, or any other nationally recognized sports club or individual, we are commanding great readership and recognition for our product. In other words, the popularity of the sport is the vehicle through which recognition for honey is carried. It looks like a good band wagon.

Since our nationally organized promotion began less than four years ago, the per capita consumption of honey in Canada has increased approximately 50 per cent.

When appraising the situation we must not neglect to give due credit to those energetic individuals, companies, and co-operatives across Canada which have at their own extra expense promoted their own private brands.

Skunk Cabbage. . . .an Early Friend

By Walter Barth, Assistant Editor

Growth stages of skunk cabbage. Left to right, young leafy shoots and root stock, and the mature plant with the purplish-yellow spathe (modified leaf) that protects the flowers.

EARLY BROOD rearing places a heavy demand on the supply of pollen within the hive. So at the first signs of good weather, field bees will probably fly out in search of new pollen sources to replenish their dwindling stores. Skunk cabbage (**Symplocarpus foetidus**) frequently makes an appearance at this time, supplying yellow pollen to the foraging workers.

Many of the common and scientific names of skunk cabbage are indicative of its most striking characteristic, namely, the offensive skunk-like odor that is given off. Here is one plant that is likely to escape extermination at the hands of enthusiastic gatherers of spring flowers.

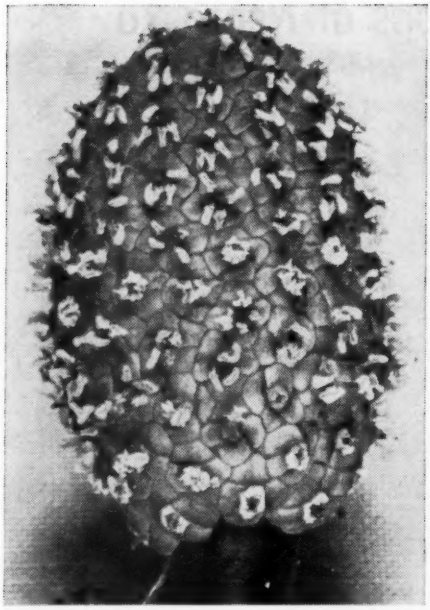
Skunk cabbage goes under a number of different names such as Dracontium, skunkweed, polecat-weed, swamp-cabbage, clumpfoot-cabbage, meadow-cabbage, collard, fetid hellebore, stinking poke, pockweed, and polkweed.

This weed is generally found growing on wet soils, swamps, and even along the banks of swift running streams. The plant is able to develop in spite of the weather since it has an internal temperature somewhat higher than the surrounding air and water.

In late February or early March, light green, leafy shoots make their appearance through the snow or icy waters. In four or five days a reddish tinge appears on these leaves, and a few days later this is followed by the emergence of the spathe (a modified leaf) from the leafy shoots. This purplish-yellow leaf gives the characteristic appearance and odor of skunk cabbage.

The spathe surrounds the yellow flowers which are crowded onto a stalk similar to a head of cauliflower. All of the flowers on one stalk do not open at one time, thereby extending the period when pollen is available.

Honey bees were the first pollinators that this writer observed working on the blossoms. Other observers have noted slugs and scavenger beetles as late seasonal visitors to the bloom. However, with the appearance of



Bloom of Skunk Cabbage. Many flowers in different stages of development are visible. Some of the flowers are fully open while others are still partly enclosed by the sepals. The flowers are yellow while the stalk is dark purple.

bloom from willows, maples, and other early pollen sources, honey bees soon lost interest in skunk cabbage. But their interest was taken over by large numbers of small flies.

Past Uses of Skunk Cabbage

IN THE PAST, the root stocks of this plant were collected for pharmaceutical uses. After the blooming period the roots were cut, dried, and sold at four to seven cents a pound. A dried powder made from these roots had been successfully used as an antispasmodic, emetic, ointment, and as a remedy for catarrh, chronic coughs, and asthmatic cases. Only small doses could be given because the remedy would often produce a bitter and burning (acrid) effect like arum, and possible vomiting, headache, vertigo, and temporary blindness.

A bread flour, having a cocoa flavor, has been made from the roots of this plant, according to botanists M. L. Fernald and A. C. Kinsey. "But, in a few minutes after it has been eaten, the mouth stings with the peculiar burning and puckering sensation familiar to all who have eaten the fresh root of Jack-in-the-Pulpit."

Skunk cabbage leaves are also recommended by these authors as a palatable vegetable. "During boiling no trace of the characteristic, disagreeable odor is given off, but the cabbage should be cooked in several waters to which has been added a pinch of baking soda. Serve with vinegar and butter or other sauce.". . . .Yum, yum.

Another 4-H Beekeeper

ERNEST BROD, born in Turkey and now a resident of Chatham, Ohio, has been in the United States only five years but a 4-H member three of these years.

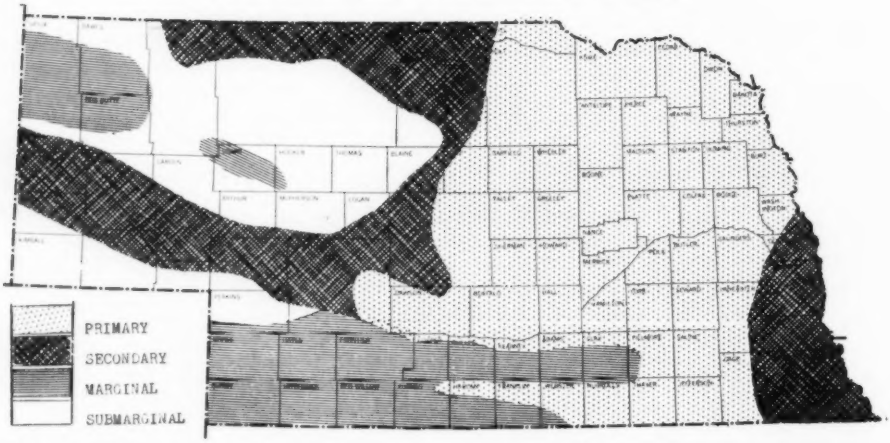
In 1953 he took bees for his 4-H project and turned in an outstanding record book. This project, started with one hive of bees last spring, has grown to eight hives. However, in that short time he has really learned to handle bees well.

Ernest is 12 years old and is already an honor student of the seventh grade at Chatham school. His hobby is stamp collecting but his favorite pastimes are beekeeping and baseball.

Ernest Brod taking care of his 4-H beekeeping project.

Beekeeping Regions of Nebraska

By C. J. Walstrom, Nebraska State Apiarist



NEBRASKA, located in the heart of the plains area, is thought by many to be one of the great honey producing states. While it is true that we take off some pretty fair crops of honey, it is important to remember that Nebraska has a greatly diversified system of agriculture. The western end of the state, primarily wheat and grassland, and the great cattle country of the sandhills with its miles and miles of grass land affords little in the way of honey plants. Nebraska has **more miles of river frontage than any state in the Union.** This river frontage supplies abundant pollen in the spring. While most of our bee territory is in the eastern one half of the state, where these rivers extend westward, good honey producing territory exists.

Nebraska produces primarily sweet clover and alfalfa honey. Occasionally in the fall of wet years some honey is obtained from heartsease.

Being centrally located and having fair honey crops, Nebraska is visited each year by quite a few migratory beekeepers from Texas and California.

Good honey producing areas in Nebraska are pretty well covered with commercial beekeepers. Anyone desiring to move bees in would do well to investigate the territory thoroughly to avoid over crowding. It may be well to remind anyone desiring to move in to Nebraska to be sure to contact the State Apiarist, supplying him with the proper health certificate and application for permission to move into the state.

In the following break-down there are exceptions within each area where the general classification will not hold. However, these areas are too small to show on the map. To the greater extent the classifications hold true.

Primary Region.—This area generally includes the eastern half of the state. Commercial honey production is normally good. The primary nectar sources are yellow and white sweet clover and alfalfa.

This area includes **all or part of** the following counties: Boyd, Holt, Loup, Custer, Garfield, Valley, Sherman, Buffalo, Dawson, Lincoln, Gosper, Phelps, Kearney, Adams, Webster, Franklin, Harlan, Hall, Howard, Greeley, Wheeler, Knox, Antelope, Boone, Nance, Merrick, Hamilton, Clay, Nuckolls, Thayer, Fillmore, York, Polk, Platte, Madison, Pierce, Cedar, Wayne, Dixon, Stanton, Cuming, Colfax, Dodge, Butler, Saunders, Seward, Lancaster, Gage, Jefferson, Saline, Washington, Burt, Thurston, and Dakota.

Secondary Region.—The western portion of this region, generally speaking, borders or fringes the sandhills area. Normally fair to good honey yields are obtained. However, in peri-

Aerial view of north central Nebraska. This photo was taken at 5,000 feet near Valentine in Cherry county. Picture taken by Charles W. Moosman.

ods of low rainfall the yields would be more apt to tumble in this area.

The eastern portion of this secondary region at one time was included in the primary; however, for the last 10 to 12 years yields have not been sufficient to place it in the primary category. With the advent of the sweet clover weevil, coinciding with plentiful rainfall, most of the farmers of this area have switched to red clover as their major legume crop.

The Secondary region includes all or part of the following counties: Sheridan, Cherry, Brown, Keya Paha, Rock, Holt, Loup, Blaine, Logan, Custer, Buffalo, Dawson, Lincoln, Perkins, Keith, Arthur, Deuel, Garden, Cheyenne, Morrill, Banner, Scotts Bluff, Sioux, Johnson, Nemaha, Pawnee, Richardson, Otoe, Cass, Sarpy, Douglas, Saunders, Washington, Lancaster, Gage, and Garfield.

Marginal Region.—This region is in practically all marginal or dryland farming area. Fair honey crops are often obtained. However, several years of poor crops or failures often intervene. There are few commercial producers who regularly keep bees in this area.

Included in this area are **all or part of** the following counties: Lincoln, Chase, Perkins, Dundy, Hitchcock, Hayes, Frontier, Red Willow, Furnas, Gosper, Phelps, Harlan, Kearney, Franklin, Webster, Adams, Clay, Fillmore, Nuckolls, Thayer, Sioux, Dawes, Box Butte, Sheridan, Grant, and Hooker.

Submarginal Region. — Commercial beekeeping would be out of the question in this sandhills area. It is practically all grass land and only in isolated spots would a colony be able to gather enough for winter stores.

This area includes **all or part of** the following counties: Dawes, Sioux, Box Butte, Morrill, Banner, Kimball, Cheyenne, Deuel, Perkins, Lincoln, Garden, Arthur, McPherson, Logan, Custer, Grant, Blaine, Thomas, Hooker, Brown, Rock, Cherry, Sheridan, and Loup.

* * *

Hornets Can Be Serious Pests

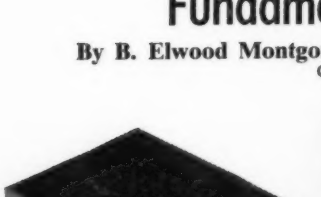
BEEKEEPERS IN ISRAEL suffer severe losses from the Oriental Hornet, **Vespa orientalis.** From 10 to 20 per cent of the colonies may be destroyed while many more are weakened, according to Mr. G. M. Michael of Post Haifa, Israel.

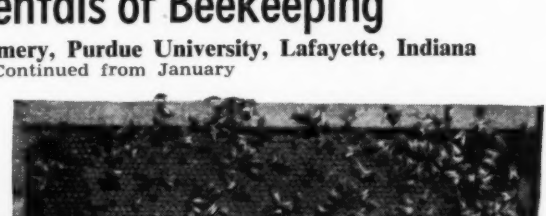
When the colonies are weak, the beekeeper adds, the hornets enter the hive and devour the bees and honey. Normally the hornets catch bees from strong colonies as they leave the hive or while the honey bees are collecting nectar from flowers.

Fundamentals of Beekeeping

By B. Elwood Montgomery, Purdue University, Lafayette, Indiana

Continued from January





BEES SHOULD be handled so that they will be disturbed in their work as little as possible. Stings should be avoided during manipulations, not only because they are painful to the operator, but also because the odor of the poison which gets into the air irritates the other bees and makes them more difficult to manage. Quick movements tend to irritate bees as their eye structure probably enables them to perceive motion rather than images, more readily.

The best thing to do when stung is to remove the sting as soon as possible without squeezing the poison sac, which is usually attached. This can be done by scraping it out with the hive tool or the finger nail. Certain of the so-called anti-histamine drugs appear to be very effective in stopping the pain and other disagreeable reactions caused by bee stings. These may be obtained in cream or salve form to be applied directly to the area of the sting.

The best time to handle bees is during the middle of warm, calm days, particularly during a honey flow. Never attempt to handle bees at night or on cold, wet or windy days.

How to Use Smoker

Before opening a hive the smoker should be lighted and veil and gloves put on. The proper fuel for use in the smoker is one that yields a mild smoke and that lasts well. Scraps from old burlap bags make very satisfactory smoker fuel. Some beekeepers use chips of wood, discarded oil waste from the machine shop, ground corn cobs or dried seed heads of sumac.

A few puffs of smoke directed into the entrance will cause the bees to fill themselves with honey and will drive the guards back into the hive. One corner of the hive cover should be raised gently, using the hive tool to pry it loose as it will usually be sealed down by the bees. When slightly raised, a little more smoke should be blown vigorously into the opening across the tops of the frames. It is desirable not to use any more smoke than just enough to subdue the bees and keep them quiet on the frames. If at any time during the examination of a hive they become excited or restless more smoke should be used. Stand at one side or the back of the hive to be out of the line of flight of bees leaving or returning to the hive.

When frames have been exposed they should be loosened and then crowded together gently with the hive tool, to give room for the removal of one frame. The first frame removed may be set on the ground, leaning against the front corner of the hive so that if the queen should be on this frame, she will crawl into the entrance easily, if she should leave the comb. This allows more space for handling the remaining frames. Avoid mashing or crowding the bees as this excites the colony and may render it necessary to stop operations.

In examining a frame, hold it over the hive if possible so that any bees which fall will drop into it. Unripened honey frequently drops from the frame.

If it falls in the hive the bees can quickly clean it up, but if it drops outside it tends to "mess-up" the bee yard and may start robbing.

If a frame is set on the ground, leaning against the hive it should be placed in a nearly upright position to prevent breakage and leaking of honey. The frame on which the queen is located should not be placed on the ground, because she might crawl away and be lost. It is best to lean the frame against the side of the hive away from the operator so that the bees will not crawl up his legs.

IN HANDLING FRAMES the comb should always be held in a vertical position. When a frame is lifted from the hive by the top bar, the comb is vertical and the side toward the operator can be examined without any change of its position. To examine the other side raise one end of the top bar until it is perpendicular, turn the frame on the top bar as an axis until the opposite side is facing the operator, then lower it to a horizontal position with the top bar below.

As the examination of a hive is made the frames should be kept in order. If one has been temporarily removed to give additional space for handling the remainder, it should be returned to its original position when the examination is completed.

A Normal Colony of Bees

A normal colony of bees during the active season will contain three castes —workers, drones, and a queen. The workers and queen are females and the drones are males. All of these develop from eggs laid in the cells. Fertilized eggs produce females and unfertilized eggs produce drones. All pass through three stages of development before they become adults, as shown in the following table:

	Queen	Worker	Drone
Egg	3 days	3 days	3 days
Larva	5½ days	6 days	6½ days
Pupa	7½ days	12 days	14½ days
Total	16 days	21 days	24 days

The length of time required for development is quite uniform at all seasons, due to the fact that the bees maintain a fairly uniform temperature within the brood nest. The adult worker may live four to six weeks during the active season and several months during the dormant season. In other words, they have a given amount of energy to spend, and when that is consumed they die. For this reason their energy should be conserved during the winter especially. This can be done by giving proper winter protection and stores.

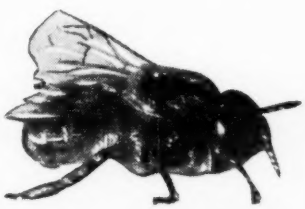
Members of the Colony

Queens may live several years. Most of them, however, have passed their period of usefulness within two years. A great many good beekeepers requeen each year. This, however, is a matter of individual merit shown by the strength of the colony and the way the bees perform their work.

The queen normally mates but once during her lifetime. This takes place in the air at a considerable altitude and usually between the fifth and eighth days after emerging as an adult. The male sperm received at the time of mating is her lifetime supply. When the supply runs low or is exhausted the queen lays only drone eggs and consequently is of no value and should be replaced. Except at the time of swarming or supersedure there is only one queen to a colony.

The queen is a fully developed female and her only duty is the production of eggs. She is reared in an especially constructed cell, which usually points downward, is about one-third of an inch in diameter and when completed somewhat resembles a pea-

Worker



Drone

Queen

nut shell. Upon hatching the minute grub or larva is surrounded by a creamy mass of "royal jelly," a predigested food secreted by the adult worker bees. This food is supplied by nurse bees throughout the larval development of the queen. When the larval growth is complete the cell is sealed by the worker bees. The larva changes to the pupal stage and then to the adult within this cell.

Drones are found in the normal colony only during the honey-gathering season. With a dearth of nectar in the fall they are all driven from the hive by the workers and killed. The number of drones per colony varies from a few to several hundred. We should strive for only a few since their chief function is to fertilize the virgin queens.

The workers are undeveloped females and do not produce eggs under normal conditions. Both workers and queens develop from fertilized eggs. The only factor determining whether a larva hatching from such an egg will be a queen or worker is the food which it receives. While the queen larva receives "royal jelly" throughout its development, worker larvae are given pollen and nectar or honey after the second day.

All of the work of the colony is performed by the worker bees. Their duties within the hive consist of feeding and caring for the larvae, feeding the queen and drones, cleaning, ventilating, comb-building and guarding the hive. Such duties are usually carried on by the younger bees. Field duties, which may be assumed when the bees are 14 to 21 days old, include gathering of nectar, pollen, propolis, and water.

The number of workers per colony will vary with the season. A normal colony in the spring should have 10,000 to 15,000 bees. The first of June should find the number increased to 50,000 to 60,000; extra-powerful colonies may possess 80,000 to 100,000 workers. This is the peak of population. This number will gradually diminish with the approach of fall.

Location of the Apiary

Bees should be located in a site which will provide shade and protection from cold winds. Shade is very important in maintaining the morale of the colony and in preventing swarming. An ideal location for hives is one that provides shade during the middle of the day but allows them to be exposed to the sun in the early morning and late afternoon. Care should be taken not to set the hive beneath a tree with low branches which will interfer with the work of the beekeeper. The front of the hive, which should face south, must be free from obstructions so that the flight of the bees will not be impeded.

Cold winds in the spring and winter are detrimental to the colony, causing chilled brood in the spring and general loss of colony strength in the winter. For these reasons the apiary should have a windbreak on the north and west. Such protection can usually be provided by locating the apiary on a hillside, in a valley, near buildings, a grove of trees, or a board fence.

Of course, the hives should be located so that the line of flight of the bees does not interfere with members of the beekeeper's family or others. If it is necessary to locate the hives near a path or road, or near a lot where farm animals will be kept, a row of tall shrubs or a high board fence around the apiary will turn the line of flight upward to a point beyond interference.

(to be continued)

* * *

"This look like the rascal who stole your hive?"

Let's Go on a Cooky Making Binge

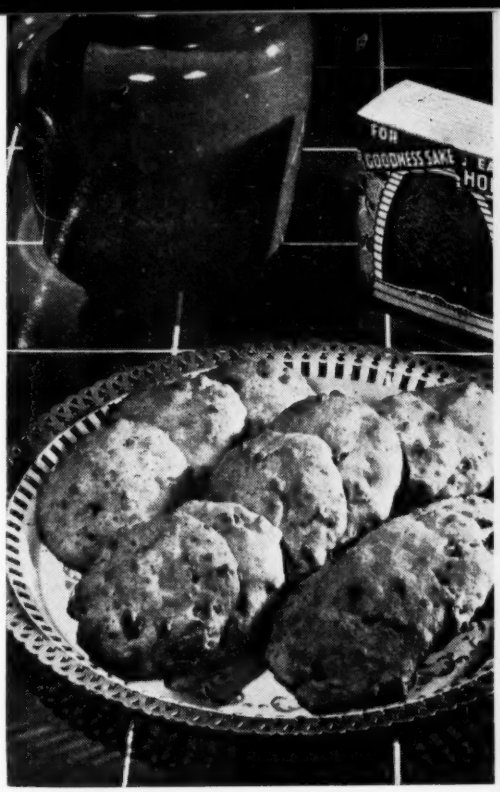
By Mrs. Benj. Nielsen
Aurora, Nebraska

CAKES MAY GO begging after the first piece or two of a fresh baking unless there are small fry around. And luscious pie may prove too much for middle-age digestion! But cookies are something else again. Rolled, dropped. or spread, these tasty tidbits will never go begging. It's fun to make cookies—and wouldn't grandmother be amazed at the variety we turn out nowadays?

Good baking to you!

Honey Drop Cookies

One-third cup shortening, ½ cup honey, 2 eggs, well beaten, ½ cup sour cream, 1¾ cups sifted flour, 1 teaspoon baking powder, ¼ teaspoon salt, ½ teaspoon soda, ½ cup chopped nutmeats, ½ cup chopped dates, ½ teaspoon nutmeg, or 1 teaspoon vanilla and 1 cup oven-popped rice cereal.



Honey drop cookies.—Photo courtesy Kellogg Co.

Blend shortening and honey. Add eggs and cream. Sift flour with baking powder, salt, and soda; add to first mixture. Stir in nutmeats, dates, flavoring, and cereal. Drop by teaspoonfuls onto lightly greased baking sheet. Bake in moderate oven, 375 degrees F., about 20 minutes. Yield: 2 dozen cookies (4 inches in diameter).

Honey Walnut Strips

One-half cup shortening, ½ cup brown sugar, ¼ cup boiling water, ½ cup honey, 3 cups cake flour, 1 teaspoon salt, 1 teaspoon soda, 1 teaspoon ginger, ¼ teaspoon nutmeg, ⅛ teaspoon cloves, and 1½ cups finely chopped walnuts.

Cream shortening and brown sugar. Add boiling water to honey. Sift dry ingredients and add alternately with honey and water to creamed mixture. Chill and roll. Cut into strips 1 inch wide and 3 inches long. Sprinkle with walnuts. Bake in moderate oven, 350 degrees F., about 12 minutes.

Honey Orange Crisps

Three-fourths cup shortening, ½ cup sugar, 1 egg, beaten, ½ cup honey, 1½ teaspoons ginger, 2 tablespoons orange juice, ½ teaspoon orange extract, and 3 cups cake flour.

Cream shortening and sugar together. Add egg, honey, and ginger, mixing until smooth. Stir in orange juice and extract. Sift flour and add slowly, beating well between each addition. Chill thoroughly. Roll out very thin on a lightly-floured pastry cloth and cut in various shapes. Bake on ungreased cookie sheet in moderate oven, 350 degrees F., 8 to to 10 minutes. Yield: 10 dozen 2-inch cookies.

Frosted Honey Ginger Creams

One cup shortening, ½ cup sugar, 1 teaspoon ginger, 1 teaspoon cinnamon, 2 egg yolks, beaten, 1 cup honey, ½ cup milk, 3½ cups cake flour, 2 teaspoons soda, ½ teaspoon salt, and 1 cup raisins.

Cream shortening with sugar and spices. Add egg yolks and beat well. Add honey and milk and blend. Stir in flour sifted with soda and salt. Add raisins. Spread ¼ inch deep in 2 well-greased 10x15-inch pans. Bake 12 minutes in moderate oven, 350 degrees F. Cool in pans and spread with confectioners' icing. Cut in squares or diamonds.

From Foreign Lands

Beekeeping Calendar Available

THE NEW 1954 "Schwaebischer Imkerkalendar" can now be had for DM 2.00, (approximately 50 cents) from Th. Zeeb, Mauserstrasse 16, Oberndorf/Neckar, Germany.

This 199-page calendar is fast becoming more and more popular. Besides many illustrations, it has ample room for your own notations and observations, plus a list of monthly chores for the beekeeper. Much valuable information by several beekeeping specialists such as: Mr. Lutzner, Neff, Dr. Buedd, Prof. Goetze, Dr. Schuessler, and Dr. Dreher can also be found in this highly recommended beekeeeping calendar.

"Die Hessische Biene", December, 1953

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How to Serve Honey

ACCORDING TO Mrs. Ted Evans, the drizzling method is the most satisfactory way to serve honey. Use a lipped jug or jar and place it in warm (not hot) water 10 minutes before it is required. The warm honey will then drizzzle out, whereas the cold honey would have poured out in a heavy stream making most foods too sweet.

The "Australasian Beekeeper", Oct., 1953

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New Mating Idea

IN MAY 1948 Mr. M. Schurmann had several ready-to-mate virgin queens in his colonies. Around 4 P.M. one day he noticed approximately six or seven insects in the air seemingly "dancing" around at a distance of 500 meters from his hives. Another insect flew from one "dancing" bee to the other. Upon contacting the fourth bee, both insects fell into the rye field over which the mating had taken place.

While carefully approaching the spot where they had fallen, Mr. Schurmann noticed one bee detaching itself from the other and flying away. On the ground he found a dead drone with torn intestines.

In the spring of 1949, after continuous vigilance Schurmann found several piled-up drones on a little bush. After observing them for about five minutes he saw one of his own virgin queens, who with a pink opalescence, flew into the air, circled twice and then flew straight to one of his own colonies. Again he found a drone with torn intestines.

After these observations Mr. Schurmann has come to the conclusion that while mating takes place in the air, bees need a firm base to separate.

"Deutsche Bienen Zeitung", 1949

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Cement Solves Ant Problem

CHR. DANIELSEN, Solbjerg, Denmark, reports that upon recommendation of a bricklayer he used cement to combat ants in beehives. After finding an ant nest filled with eggs and larvae in one of his colonies, he sprinkled cement on them and was surprised to be unable to find a single ant the next day.

Another time after moving 24 colonies to a new location, he found half the colonies being invaded by ants a short time later. Again after using cement on the inner cover of the hives all ants were destroyed.

According to Mr. Danielsen, bees are not harmed by the cement, however, ants being a little sticky are unable to free themselves of the material.

"Tidsskrift for Biavl" 86/5 (1952)

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Avoid Injury to Queens' Legs

ACCORDING TO Mr. H. Recknagel, beekeepers should inspect all queens for injured legs, Every stiff leg, especially hind legs, or even an injured foot claw is a serious hindrance in egg laying, and the queen will be unable to fill brood chambers regularly. Often virgin queens receive an accidental sting in one of their legs and are paralyzed immediately.

It is Mr. Recknagel's opinion that many beekeepers do not know of the existence of these injuries on healthy legs, much less are aware of the fact that a loss of a limb or paralyzation of such will cripple the queen.

"Imkerfreund" February, 53

Bee Facts

(A Digest of Scientific Research)

Wax Workers are a Good Credit Risk

THE SOUND internal financial structure of the beeswax manufacturing industry makes them a good credit risk, according to Russell H. Eichman, who recently completed an investigation on the subject for the Graduate School of Banking at Rutgers University, New Brunswick, New Jersey.

In view of this, he adds, you might wonder how the banks can assist the highly seasonal beeswax manufacturing industry. First, the banker can advise, assist, and protect the beeswax manufacturer in financing his importations of wax. Secondly, the banker can provide funds for working capital during periods of high inventory.

Some other subjects discussed by the author are the economic background of the beeswax industry, how beeswax is procured, early financial history, and credit analysis by means of financial ratios.

Reference: Eichman, Russell H., Bank Financing of Manufacturers of Beeswax. Unpublished Thesis. Graduate School of Banking at Rutgers Univ. June 1952.

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Honey Merchandising

ABOUT ONE in every 100 customers buying from super markets or the larger grocery stores purchase honey. So reports C. Richard Creek of Colorado A & M College, Fort Collins, Colorado.

Through an investigation, the author found that customers can be induced to buy honey through advertising, point-of-sale promotion practices, and free distribution of recipe booklets. Observation beehives placed in supermarkets attracted considerable attention and resulted in impulse purchases of honey.

"Allied product" advertising is another means of creating a demand for honey. Along this idea, honey can be jointly advertised with peanut butter or some other product.

"Possibly these two should be promoted as a unit of one jar of each product at one price," Creek points out.

While publicity in the homemaker columns of newspapers, in magazine articles, and by nutrition specialists could increase the use of honey through consumer education, much of any successful honey promotion program rests with the producers and packers. They must maintain the quality, flavor, and grade of all packs, and also present an attractive container and label if consumption and higher sales are to be expected.

Reference: Creek, C. Richard. Merchandising of Honey in Retail Stores in Colorado in 1952. Mimeo Report Unnumbered. Colo. A. & M. College. June 1953.

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Hypersensitivity to Bee Sting

ON OCCASION people have become hypersensitive to bee stings, and in rare instances some have died. Schenken, Tamisiea, and Winter investigated and reported deaths from bee stings.

The authors, Nebraska pathologists, believe that these deaths showed typical anaphylactic shock due to allergy to the proteins in the bee venom. They do not believe such cases are due to the toxins of bee venom which contains three toxic factors, a hemolytic (red-cell destroying), a neurotoxic (nerve-poison), and a histamine-like substance.

Other investigators have shown that hypersensitivity to bee stings may be duplicated by administration of the water soluble fraction of proteins made from the body of the bee from which the venom sac and stinger have been removed. The literature indicates that in such hypersensitivity, each succeeding reaction is usually worse than the

(Continued on page 126)

Editorials

Are Conventions Too Expensive?

EVER SINCE the Gleanings staff attended the Tri-State beekeepers' meeting at Angola, Indiana last summer, we have been toying with the idea of how to reduce convention costs. The successful Angola meeting was a prime example of a well attended meeting where expenses were kept low for the Associations involved, and for THE BEEKEEPERS THEMSELVES.

Beekeepers continually inform us that it costs too much to go to a state convention. Rising banquet costs almost prohibit their attendance. In view of these complaints that come from all parts of the country, we urge all beekeeping associations to follow the example set at Angola.

State associations should try, whenever possible, to hold meetings on a college campus where low cost auditorium, food, and housing facilities are available. In the majority of cases, colleges are glad to cooperate on a non-profit basis for such a meeting brings a lot of free publicity. Take advantage of available facilities of your state agricultural college where your Extension Apiarist can make arrangements for meeting halls and dining facilities. College cafeterias are a lot less expensive than hotel banquets. So why should we get so high-toned at meetings that we may scare away a lot of potential convention goers?

Some may say that their state agricultural college is not centrally located, as in New York State for example. That may be true, but there are other universities or colleges that would cooperate. Syracuse University, which is centrally located, could be a good low cost substitute for the more expensive city hotels where the Empire State Beekeepers' Association has met in the past.

Intensive vs Extensive Beekeeping

IT ISN'T HOW MANY hives we have with some bees in them that count, but rather how many real colonies of bees we have. There is a difference.

A hive containing a colony sub-normal in population, with an inferior queen and poor combs, is likely to be a detriment until the queen is replaced with a good one and the poor combs are substituted with good combs drawn from full sheets of worker comb foundation.

If a farmer has a cow in his herd that is not a good producer, will he continue to keep her? Hardly, if he is a progressive farmer. And so the beekeeper should strive to have every colony as good as the best—all good producers. It is only by raising the per colony average production of surplus honey and wax that beekeepers can hope to realize a profit from their bees.

Some years ago large apiaries were maintained. At present the tendency appears to be toward relatively small apiaries. Obviously, the number of colonies that can be kept in one location depends on the nectar and pollen available and the number of colonies kept by other beekeepers in that vicinity.

We read about Alexander, the New York State beekeeper, who kept over 500 colonies in one apiary in a buckwheat location. However, there were hundreds of acres of buckwheat grown in that region and it seemed almost impossible to overstock a location.

It is sometimes difficult to know the answer to this question because crop rotations in farming communities change and seasons vary. In any event it seems preferable to keep only as many colonies in each apiary as can be maintained profitably. This applies mainly to commercial beekeeping.

If the objective in beekeeping is to produce and sell the maximum crop of honey at the minimum of expense it would seem that our slogan for 1954 could well be, "Every colony as good as the best," which emphasizes intensive rather than extensive beekeeping.

Do Bees Chilled in Snow Die?

QUITE A NUMBER of beekeepers are concerned about bees that fly out of hives during a sunny winter day when the air is warm enough for bees to fly a short distance but too cold to permit the bees to return to their hives. Will these bees perish? This depends on how long the bees remain in the snow.

In this connection, we happeend onto an editorial by the late E. R. Root appearing in February 15, 1909, GLEANINGS. It seems that a warm January day had caused bees in a Root Company apiary to fly quite freely. The sky suddenly became overcast, a cool wind started up, and the temperature dropped. Thousands of bees were scattered on the ground. The night that followed was quite cold. However, the following day was warm enough for another flight and practically all of the seemingly lifeless bees on the ground were revived and got back into the hives. Just how many more days the bees could have remained outside before returning to their hives on a warm day, we do not know.

This same editorial referred to some work the late Dr. Phillips did prior to 1909 in putting some cages of worker bees between two cakes of ice in a refrigerator for a week during the summer. When brought out into a warm room the bees would revive. Queen bees were also refrigerated for a week, then introduced into colonies, apparently none the worse for their experience. However, no data is available on the behavior of these queens later on. Some of them may have become drone layers. Nor do we know whether or not the worker bees that stayed out all night in the cold or those put into a refrigerator, were made incapable of carrying on their duties normally.

In the North some bees are lost during winter flight days. It seems natural to assume that most of these are old bees that have practically completed their service. If beekeepers have populous colonies to go into winter, which is one of the essentials in successful wintering, there is no cause for worry concerning the few bees that may be lost during winter flights.

Majority of Ohio Joins Federation

IT WAS GOOD NEWS to learn that the majority of the members of the Ohio Beekeepers' Association, at their December business meeting, in Columbus, decided to become affiliated with the American Beekeeping Federation.

The leaders in this affiliation movement are to be commended for their efforts to lead Ohio beekeepers along the road of progress. We hope other non-affiliated states will take note and follow the example of this progressive group.

From North, East, West, and South

NORTHERN CALIFORNIA, Dec. 29

Weather: California is bone-dry, with fire hazards mounting daily. Only 0.21 inch of rain fell locally this month, leaving a shortage of 3.59 inches. Only six to eight inches of snow covered Donner Summit; last year there were 66 inches. No rain forecast for the immediate future.

Our Bee Laws: Beekeepers are becoming aware of certain glaring inconsistencies in our bee laws. The California State Beekeepers' Association has a committee to work with county beekeeping groups on needed changes. Laws which are too restrictive and arbitrary, or impractical, or which serve no useful purpose are worse than no laws and should be made practical or eliminated entirely.

Points in question are those which impose impossible conditions on the steam "sterilization" of exposed hives and hive parts, inspection of intra-state shipment of queens, erection of barriers to research in bee diseases, and the lack of recognition of any other method of controlling bee diseases than by attempted burning.

The idea of a permit system for preventing or curing bee diseases by chemical means is finding support among many beekeepers.

Honey in Storage: Very little honey remains in the hands of commercial beekeepers in northern California. Several lots were sold for export which, together with a less than average crop, leaves the California market rather short of supplies for the retail trade.

Honey House Standards: This question was given much consideration by the research committee and by various beekeeping groups, but it was concluded at the annual convention that the recommendations needed further improvement and study to include all segments of the industry before the whole was presented for adoption.

Many beekeepers have made desired changes in extracting plants in recent months and more will do so before the coming season to reduce cost of operation and to maintain the general good quality of honey. The provisions will be brought to the attention of beekeepers in different parts of the state.

Package Bees and Queens: This industry centers in northern California and producers are preparing for a good season. The queen breeders will pay close attention to the need of strains which are resistant to European foulbrood because of the increase in importance of this disease in some western states and provinces of Canada.

New Bee Film Available: A new one reel film in sound and color on The Honey Industry and its Relation to Agriculture is available through University Extension, Berkeley, and U. C. in Los Angeles. It was made possible by the California Honey Advisory Board. Rental charge, $3.00. —J. E. Eckert, Davis, California.

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MONTANA, December 30

Weather: Most of last fall was like April. Today there is a chinook. The last two years have been very dry, but plenty of water for irrigation. Parts of the state had ample rains.

The honey is all sold or contracted and most of it has been moved. The price is improving somewhat.

Wax is about all made up and part of it sold, with plenty on hand to be made into foundation. Some was sold for grafting and some to make shoe grease.

Conditions: The bee business is quieter than it has ever been in Montana. Very few bees are packed for winter any more. Sentiment is growing in favor of killing off bees in the fall. I have not killed any except queenless colonies.

The honey was produced and extracted the latest I have ever seen. The regular fall work was about all done in October.

When the honey flow finally came bees were about as uniform and as strong as I ever saw. The crop was not the same as other years, some parts of the state had the largest crop on record. The bees have gone into winter in the best of shape. There must have been some honey flow late in the season as lots of hives are very heavy with honey now.

Prospects for 1954 for help seems to be better than some years. Bear have been very active in a few yards. They sure can do about as clean a job of destruction as anything I know of except fire or flood.

Most of us are beginning to get lumber, foundation, paint, and other supplies ready for early spring work. We have had a good holiday season and now have plenty of work coming up.—Parson Pile, Corvallis, Montana.

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TEXAS, January 7

Weather: The coldest weather of the season thus far prevailed during the last of December. Rainfall continued normal with soil moisture ample over most of Texas, although many points in south and west portions remain abnormally dry.

Bees and Plants: While bees were kept inactive during cold weather there was ample flight on warm afternoons. Most colonies remain broodless, although in many localities brood rearing has started. In general, colonies are in good condition but in sections with scant rain during fall colonies are weak and short on stores.

Locally bees are working spring beauty and dandelion while other localities report nectar and pollen being gathered from several shrubs and mistletoe. With generally favorable soil moisture spring flowering annuals are plentiful, trees and shrubs are improved, and prospects favorable for spring bloom.

Beekeeping is becoming more dependent on cultivated farm crops for honey production. From present indications reduction in allowable cotton acreage for spring planting in Texas some three million acres likely will be diverted to other crops.

Seed production of major legumes—sweet clover, alfalfa, vetch, and crimson clover—in 1953 is below the amount of the previous year and the average of recent years. Price of the seed remains relatively high. Under the circumstances increased acreage of legumes is expected. Beekeeping should be benefited especially if sweet clover is included in the planting.

Market: Honey in the retail market has shown only moderate movement during the holiday season with little improvement since. Prices are unchanged. Many producers have disposed of their crop. Stocks remaining are largely in the hands of packers and producers who supply the local trade.

Miscellaneous: Early inquiries and orders booked thus far indicate that the sale of package bees during the coming season likely will be below that of last year. Queen bees, however, are expected to be in demand, about as the same as last year.

During recent months excellent articles on the handling and care in extracting and packing honey have appeared in the bee journals. These articles are worth reading again.

Seldom can a producer afford a filter press. However, with ordinary equipment and care in extracting, straining and settling, honey can be prepared with a minimum of comb particles and air bubbles suitable for bottling honey of high quality that will appeal to the consumer.—A. H. Alex, College Station, Texas.

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KANSAS, January 9

Production Relationships: The soil moisture conditions were improved during the first part of the winter in northern and central Kansas by several rains and snows. The northcentral area probably is in the best condition of any part of the state. This was the case during the growing season of 1953, which enabled

the beekeepers there to produce an excellent crop of honey.

Honey production in Kansas during the past few years has been rather spotted. This evidently is the situation in other regions.

Condition of Colonies: The first half of winter in Kansas has been rather favorable for wintering colonies, due to the fact that mild weather has prevailed, except for one or two days of near-zero temperatures. On the whole, the temperature has been low enough to prevent general flights.

From 1952 to 1953, there was a rather sharp decrease in the number of colonies within the state, which is due primarily to cost of production factors and several of the commercial beekeepers retiring from the beekeeping business or making arrangements to retire.

Most of the commercial beekeepers have reduced the number of their colonies to the point where one man can adequately care for them without involving extra labor, except during the production season.

Alfalfa Pollination: Beekeepers in Kansas have, to a great extent, lost interest in alfalfa pollination because of the unfavorable prospects in tentative contracts. Another factor involved in this situation is the comparatively low price of alfalfa seed. If a beekeeper accepts alfalfa seed in payment for pollination services, it means he has to market this seed, which involves new procedures for the beekeeper.

Beekeeper Encouragement Needed: From an agricultural standpoint, colonies of honey bees are needed for the pollination of crops. With extensive reduction of colonies, this is a serious matter. The reduction in the number of colonies is directly correlated with the cost of production and the price of honey.

One or two commercial beekeepers are contemplating retiring from the business, but apparently there are no newcomers to replace them.

An effort should be made to encourage more 4-H Club work in bee culture. The Northeast Kansas Beekeepers' Association, which is located in the vicinity of Kansas City, Kansas, is to be commended for its efforts along this line.—R. L. Parker, Manhattan, Kansas.

KENTUCKY, January 7

Weather: For the second straight year a serious drought played havoc with honey plants and surpluses. Most of Kentucky was declared a disaster area and the dry weather extended much later into the fall than the previous year.

The Honey Crop. Small crops were the rule with several beekeepers reporting complete failures. A beekeeper in eastern Kentucky obtained a 100-pound average by doubling up his hives. The crop was not only small in central Kentucky, but frequently very dark and poorly flavored and often mixed with honeydew.

Honey Plants: Fall asters and goldenrod bloomed fairly well in October and the frost aster continued to yield through part of November. Some summer honey was reported from buckbrush in hilly country. The golden honey plant, or stickweed, the outstanding fall honey plant in the eastern mountains, also did fairly well, but sourwood, as elsewhere in the southern Alleghenies, was almost a complete failure.

Condition of Bees: Most beekeepers report that their colonies went into the winter fairly well supplied with aster or goldenrod honey. However, there was so little brood rearing in late summer that there may be too few young bees to last out the winter. There are reports of colonies dying during a zero spell in late December with honey in the hive.

In the Louisville area there was another serious outbreak of American foulbrood. Robbing was frequent and helped spread the disease. In spite of their many troubles, many beekeepers write that they plan to expand their apiary in 1954.

The Market: Most of the honey made in Kentucky is sold at retail in small lots from the home. Most beekeepers report that their crop is sold out by January 1, and that they could easily sell more than their bees store. Most Kentucky honey is retailed at 30

to 40 cents a pound, and comb honey brings as high as 50 cents.

Miscellaneous: The honey exhibit at the Kentucky State Fair was larger and better than usual and included five exhibition hives. Moving pictures of the life of the honey bee were shown outside the building each evening from the association trailer. Among the beekeepers who registered were many who were not previously known to have bees. Honey exhibits at fairs are certainly an excellent way to get in touch with new beekeepers.

At the recent election of the Kentucky State Beekeepers' Association, Burton Peck was elected president, Fred Miller, Treasurer, and James Dierken, secretary and editor of the **Kentucky Bee Line.**—Harvey B. Lovell, Louisville, Kentucky.

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NEW YORK, January 9

Weather and Bees: Present winter conditions over most of New York State are normal although we had a warm fall, and combined with a short fall crop, especially in the eastern section of the state, may make some feeding necessary this spring. In the northern, western, and central sections of the state it has been reported that colonies are heavy and no feeding should be necessary in these areas.

Spring Meeting: The Empire State Honey Producers' Association meets April 2 and 3 in the Hotel Ten Eyck in Albany. Albany was chosen so that the Association might work closely with the Department of Commerce on the New York State honey promotion program. Representatives from the Department of Commerce will be present and a television show is being planned to coincide with the meeting. Mrs. Grace from the American Honey Institute will be present for both the television program and the meeting.

In addition, methods of cutting production costs will be discussed, including honey house equipment and methods. Attention will be given to pollination problems and spray poisoning especially as it concerns forest insects.

Miscellaneous. Commercial beekeeper reaction to the use of sulfa in this state is negative. New York State has one of the best inspection systems available. This is one reason why commercial beekeepers here have not resorted to sulfa. Another is the fact that two bad outbreaks of American foulbrood have occurred in the State because of the misuse of the drug. Losses from disease in New York are small and it is felt it is better to expose and do away with a little disease than to risk super infection in addition to the work and worry involved with a "cure".—Roger A. Morse, Ithaca, N. Y.

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VERMONT, January 7

Weather: While the weather to some may not be interesting reading, yet upon it depends our success or failure for a honey crop. To us it's vital information. While our fall has been abnormally warm, looks like winter has finally settled down to business, cold and snow is now on the program with the start of the new year. If a hard winter means a good honey crop, we hope the hard winter is finally starting.

Bees: There is no question the warm fall has caused an increase in consumption of honey so that they have less stores as a rule than if we had had a normal fall. It will mean watching for starvation early next spring. Otherwise, they should be in good condition.

Many authorities seem to feel a hive bulging with bees is essential for successful wintering, but in this area such hives usually starve to death before spring. We much prefer our bees to conserve their stores in fall and not waste honey raising more bees that consume more honey that eventually must starve. Here an average size colony with plenty of honey has plenty of time to build up for the honey flow.

Market: Whether it is due to a short crop and a larger demand for honey or both, there is no question honey will be very short this year. Since we got only eight tons of honey from 900 colonies, our honey is all gone now, and the market begging for more. This

is a very embarrassing situation and nothing can be done about it. For one thing, there is no honey to buy and if we could buy it, with present prices we would lose perhaps two cents per pound selling it.

The Editors on page 33 (January issue) mentioned Lloyd Percival of Sports College and the work he is doing promoting honey for athletes, and this promotion work is solely because of the excellent results they have found with the use of honey. We should indeed praise the value of honey in the diet to the house tops by all beekeepers using it themselves and telling others of its virtues. All beekeepers should send to Sports College, Toronto, Canada for copies of their bulletins which I believe cost only $1.00 per year. With such publicity the per capita consumption of honey in Canada is about four pounds per year. With such a consumption in the U. S., we could never satisfy the market.—Charles Mraz, Middlebury, Vt.

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ONTARIO, January 7

Is our climate becoming warmer? This has been a subject of spirited discussion during recent years. Our weather scientists say the warmer trend is part of a cycle which will ultimately reverse itself. The ordinary citizen is convinced that our winters are not as cold as in grandfather's day. According to the Meteorological Service, 1953 was the warmest since 1840.

November temperatures were above average. Bees flew freely most of the month. One district beekeeper reported a little pollen being gathered on November 17th, which must be a record for this area.

If this tendency to milder winters continues, it poses a problem in management. The amount of packing believed necessary in a severe winter can be detrimental in a mild winter, causing too much activity, with consequent abnormal consumption of stores, and depleted energy. Yet we hesitate to alter the established practice lest an old-time winter descend upon us. However, of late years we have found that two or three inches of packing on the sides, and four to five on top produces good results, compared with six inches of side packing, and up to a foot on top considered necessary 30 years ago.

I am told that in southwestern Ontario some beekeepers winter without packing, and here in the central part of southern Ontario colonies in neglected apiaries have survived without protection.

Tarred paper packs with leaves, straw, or shavings are becoming popular, and a few wrap the hives in tar paper only. I don't like tar paper. It is a nuisance to handle, is often torn off by skunks in late fall, and can be used only once.

I have experimented in a small way with a shell made of half-inch lumber, the inside dimensions a half-inch larger than the outside dimensions of the hive. It slips down over the hive, fitting snugly, and is painted black to absorb solar heat. Inch thick "Insulboard" cut to size provides top insulation. The hive lid is the winter cover. In locations thoroughly sheltered from wind, in full sunlight, bees have wintered well.

This winter I am trying a few in more exposed locations. Advantages are—saving in time and labor, about an hour to pack or unpack a 40-colony yard; no packing material to attract mice and many years service.—Allan T. Brown, Peterborough, Ont.

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Caucasians vs Italians

By H. Geo. Watkins, Mill Valley, Calif.

TO ADD FUEL to the argument of Caucasians vs. Italians; I wish to state that I have kept both for the past five years and have found that with identical management, the Caucasians do leave the hive earlier, consistently find sources of nectar before the Italians, remain more constant to nectar source, and produce more quality bulk comb honey.

I hived a swarm of Caucasians in early June of this year in a super of drawn combs. All additional supers contained foundation. The hive produced a total of 120 pounds of bulk comb honey. The bees were left nearly 100 pounds of honey for wintering.

Live and Learn

By Propolis Pete

A dry sugar feeder tray with sugar on top.

HOPE THAT I am not boring you with all this talk about my observation hive, but my prediction in last months' Gleanings came true. We had a spell of cold weather, during which the thermometer went down to ten, and stayed thereabouts for a week. The bees cuddled up together, and they are still there. Half a dozen of them were scattered all around the single comb, apparently chilled before they could get back to the cluster. Looking through the glass, it is almost like a picture in which the motion was stopped by the camera.

I haven't touched them, and won't. I am just curious enough to wait and see if any of them come back to life when a warm spell comes along. All winter, every time I start a fire in the stove in my shop, a couple of wasps come back to life and fly around. When the fire goes out, they go back to sleep. I don't know what they live on, for surely they must need some nourishment during the time that they are active.

Several times I have mentioned that my bees bring in pollen out of season. On Thanksgiving Day, 1952, I saw them bring in pollen in good volume. They did the same thing in 1953, that day also being unseasonably warm. But who ever thought that I would see them bringing it in on December 22nd. They did. It was a dirty yellowish color that might have come from almost anything including sawdust, but there it was. The occasion was a warm day such as we have after a cold spell, and the thermometer went way up into the 50's. The whole yard came out to see what was going on, and I thanked my stars that this year we have an electric clothes dryer. The warm spell lasted only for the day, and the bees went right back where they belonged, but I wonder what is going on inside the hive.

Would such a thing start brood rearing? Assuming that they were tightly clustered, as they were, would one day of such abnormal warm weather give them ideas? Especially with pollen coming in? Or, when it chilled again, would they just go back into the cluster and forget that they found some pollen on December 22nd, I was tempted to open up and see what was going on, but resisted on the grounds that what I didn't know wouldn't hurt me, and that I couldn't do anything about it if they were, and besides, getting them more stirred up than they were, I might start something.

I am sending along a picture of my dry sugar feeder tray. Three hives were packed this way last fall, and I am hoping that it will be as big a success this year as it was last year. It sure does away with a lot of work to do it this way. No syrup to mix, carry, or spill. The sugar comes in five-pound bags ready weighed off for you if you want to keep records, and the whole thing is packed in with the rest of the hive. To open it simply means taking

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American Honey Institute News Notes

By Harriett M. Grace, Director
Commercial State Bank Building, Madison 3, Wisconsin

DID YOU EVER take a personality test? Or one of these How-Good-a-Husband-Are-You queries? Or perhaps a mental exercise on "How Good Is Your Vocabulary"?

Probably you have just for the fun of it. But here is a short quiz you should take, and should take seriously. "How Good a Merchandiser Are You", is its title.

Answer yes only when your conscience tells you the answer really is yes. If you come through with a flying 100 per cent your honey crop will hardly have a chance to reach the market place before it will be sold this year!

1. **Are you progressive?** No status quo for you, no siree! To sell honey you must strive constantly to make it more attractive than the products of your competitors. Once you reach supremacy, you will realize that competition will soon catch up, so you must be on the watch for even better ideas. Never a chance to rest or be content.

2. **Are you ambitious and energetic?** The early-bird idea still holds true and it's the man who drives and DRIVES after the profits who will come home with them. Dr. Charles Mayo of the famed Clinic once told an executive to hire men with ulcers if he wanted men with boundless energy who would work themselves to death. We don't care for that extreme, but we do recognize the value of a little push and zip.

3. **Are you alert?** Golden opportunities often slip by unnoticed unless the honey merchandiser has his eyes open and is watchful. Once missed, that opportunity will never again present itself to you.

4. **Do you believe in your own product?** No, that is not as weird a question as it might sound. Do you use honey yourself, at home, abundantly? Are you thoroughly convinced that honey is an excellent food, so that you sound convincing when you talk to customers?

5. **Do you follow marketing trends?** Are you up on the latest way to arrange displays, to allocate your advertising dollar, to make allowances for the customer's ability to pay?

6. **Are you enthusiastic about your honey?** And do you show it? There is no easier way to convince a grocer who is handling your honey to display it prominently than to let a little of your own genuine enthusiasm for your product brush off on his coat sleeves.

7. **Do you plan ahead?** In other words, have you already started coordinating and thinking out your marketing program for this year, even though the honey has not even been made as yet by your precious honey bees?

8. **Do you recognize your own role as producer, as seller, as worker,** as **executive?** Honey businesses as a rule are small and the beekeeper tries to handle all aspects of his business. It is no small order, but it can be done.

Merchandising is fun if you measure up. How did you do?

California Meeting

MORE THAN 200 beekeepers and their wives attended the annual convention of the California State Beekeepers' Association at San Jose, December 1, 2, and 3. The convention was highlighted by the erection of a historical marker at the San Jose airport, commemorating the establishment of the first apiary in California in 1953.

Some of the subjects discussed at the meeting were the results of bee breeding research, chemical control of bee diseases, toxicities of newer pesticides, development of hive hoists, honey marketing problems, minimum standards for honey extracting plants, and the future prospects of pollination services in legume seed production.

Elections were held, and the new officers for 1954 are Perry Dyer, President; Harold Fredrickson, Vice-president, and A. K. Whidden, Sect'y-treasurer.

Second Glances

C.M. Isaacson

As a honey plant, birdsfoot trefoil apparently does not equal its value for hay and pasture (page 9). When used as a pasture plant, this is not surprising, as even sweet clover sometimes fails to yield well from quite heavy bloom when pastured—this is especially true during the latter part of the season. Perhaps different varieties of trefoil will be found that will yield nectar more heavily.

Beekeeping as a Scout or 4-H project should be fine. It can evoke intense interest and under proper supervision should prove successful in the majority of cases. But perhaps it is only fair to warn Carol Haug that she is going to be stung more than twice if she stays with her bees—she has been rather fortunate so far! And perhaps her Daddy has had something to do with "the bees taking care of themselves most of the time" (page 11).

All new ideas must pass two tests—time and practical usage. Whether plastic foundation will ultimately be accepted will be known after beekeepers over the world have had time to test it thoroughly (page 12). It does have points that appeal to the imagination, but also apparent disadvantages, as Mr. Latham mentions.

Fundamentals of beekeeping are much the same everywhere—only the ways of insuring them differ according to locality. Packages are a good way to begin beekeeping and the methods of installation given by Mr. Montgomery should be good for beginners (page 14). I would like to make a small addition, however, that might save a newcomer to the game some trouble. When "pouring" bees from the package into the hive they are likely to fly rather freely no matter how late in the day they are installed unless they are first wet down fairly well (use plain water or **thin** sugar syrup) so their wings are wet. It is also well to have the hive entrance reduced to a very small opening as the article mentions. The queen can be wet with the warm water or syrup and released directly—there will be no danger of her flying away then.

Migratory beekeeping is common in California—almost the rule according to E. R. Jaycox (page 18). The map and descriptive material included make quite plain the most profitable areas for beekeeping in the state. For any planning a move there the article should be of considerable help.

Low speed is best for the common rotary honey pump—higher rates of operation tend to incorporate considerable air into the honey being pumped. Centrifugal pumps are undesirable for this same reason (page 20). It might be mentioned also, that a pump can operate at a higher speed with warm honey than with cold and still leave the appearance of the honey satisfactory. Many beekeepers heat the honey in the syrup slightly for this reason.

Honey in baked goods helps appearance as well as flavor—it makes them brown nicely (page 23). And I can testify that Mrs. Nielsen's basic waffle recipe is good tasting—we used it for supper last night. Honey "on and in" waffles is a decided success.

Various methods of feeding can be used to fit the occasion. Honey in the comb is by far the best if there is no danger of spreading disease. For syrup feeding, pouring the mixture directly into the combs is good (using a spray or sprinkling can). The ordinary friction top pail is satisfactory in most cases, and a division-board type is fine also, if provision is made to keep too many bees from drowning. Open yard feeders though (in my opinion) are usually wasteful—and inefficient in that colonies needing the most feeding sometimes get the least (page 28).

Better no price support than too low a figure says the Editor (page 32). His reasoning seems valid and beekeepers should keep the advice in mind when the new parity figure is being decided. Perhaps, too, it could be that the "crutch" can be thrown away, and beekeeping walk by itself again. It is a thought.

A Talk to Beekeepers

With Special Attention to Beginners

By M. J. Deyell

The editor in his model T Ford, brass radiator, open air truck, which served also as a touring car.

Visiting Bee Yards During Winter

IT GIVES ME sort of a sad feeling to walk through an apiary on a cold winter's day when the hives are covered with snow. Perhaps, I am sort of sentimental in my make-up. I always recall the beautiful summer days when I manipulate the hives and watch the bees carry in nectar and pollen.

Even though the bees and the beekeeper need a rest during cold weather, most beekeepers look forward to and long for the warm days of spring when it is again possible to work with bees.

I See a Winter Cluster

While I do not make a practice of removing hive covers during the cold months, occasionally I do remove one and I did so the other day. I found what I expected to find, a nice cluster, spherical in shape, occupying spaces between seven combs. The bees on the outside of the cluster were practically motionless. I never cease to marvel at the manner in which bees, being cold-blooded insects according to the authorities, can generate a sufficient amount of heat on the inside of the cluster and form a shell or periphery on the outside of the cluster to keep a large portion of the heat inside.

Provided colonies are populous, have plenty to eat, and are reasonably well protected from the cold winds, there is nothing the owners can do during February to improve wintering conditions.

In some parts of the South, bees are now collecting pollen and nectar. Some colonies may have brood in from three to five combs. In the far South it may be necessary to put on some supers to make room for incoming nectar. Here in northern Ohio, we have found that queens begin laying some eggs during late January and gradually increase laying as spring approaches, but do not begin to lay heavily until fresh pollen is available.

Michigan Experience
Chapter 2

In last month's talk, I mentioned relating some experiences I had in northern Michigan years ago, telling of some mistakes I made in managing the bees, in order that beginners might avoid similar mistakes.

The colonies I bought, as already mentioned, occupied eight-frame single-story hives. Such colonies required careful attention in the fall to see that they had ample stores, also during the spring months to make sure they were supplied with food. I wintered the

bees in a cellar, about which I will have more to say later.

The single-story eight-frame hive is a far cry from the two-story ten-frame hive, commonly used for wintering hives at the present time.

Starving Bees

Being rather inexperienced and unfamiliar with beekeeping conditions in that locality, I assumed that bees would gather enough nectar during the spring months for their needs. In that area there are various sources of nectar in the spring, such as dandelions, fruit bloom, and what is called pin cherry. I realize now that if my colonies had been up to good strength at the time this pin cherry began to bloom, many of the colonies would have stored some surplus.

As in most locations, there were cool rainy spells during the spring. One morning following a cool spell, I was walking through the apiary and observed some dead bees and young worker larvae in front of a hive. On removing the cover, I found all the bees dead. On looking into another hive the colony was found in a starving condition. It suddenly dawned on me that many colonies were on the verge of starvation.

No Bee Feeders on Hand

I DID NOT have any bee feeders or granulated sugar, so had to do something and do it quickly. I hopped into my model T Ford and drove to town for a few hundred pounds of sugar. I found some boards 10 feet long which I used for making a trough, similar to the old fashioned hog trough. This was placed near the apiary and filled with warm sugar syrup. Fortunately, the weather turned warm enough for the bees to fly and find this syrup. In a short time thousands of bees were lapping up the syrup out of the trough. This did not cause any robbing because all colonies had access to the food. The entire apiary was fed in a short time and starvation was averted.

I do not recommend this method of feeding, except possibly as an emergency measure. When such feeding is done, the syrup should be rather thin, approximately two parts water and one part sugar, which is somewhat similar to nectar.

I am of the opinion that such outdoor feeding, which may be said to be comparable to a heavy honey flow, gets the bees unduly stirred up and uses up more of their energy than feeding syrup inside of the hives.

Feeding granulated sugar instead of syrup is now being done by some beekeepers. The late A. I. Root fed sugar many years ago. We have tried it recently. Bees that really need food will take granulated sugar if the weather is warm enough for the bees to break the cluster. However, it would not be very suitable for bees that are close to starvation, because they might not be able to utilize the sugar properly.

The Big Freeze in June

The first year we were in Michigan we had a nice garden. By the middle of June potatoes and other vegetables were up. The weather during early June had been quite warm. The raspberry blossoms were out and the bees had begun carrying in honey. Then about June 20th a cold wave struck.

I had been hauling empty five-gallon cans from Copemish in my model T truck. The weather turned so cold that I had to wear my cap, mittens, and a heavy overcoat. On June 22nd we had a frost which froze milk in our unheated pantry. The garden was blackened. Things in general looked terribly black. We feared the raspberry plants were ruined. Some of them were. Those of you who have kept bees in the raspberry area know that this flow lasts about a month and that the raspberry cane starts to blossom at the tip end and continues on down to the base of the plant.

This cold spell delayed the honey flow somewhat, but in due time bees began working and by the first week in July, the flow was on. We did secure a fair crop of surplus honey that season. Usually, things do look darkest just before the dawn.

A Little Trick of the Trade

IT SEEMS that swarming is usually worse in the North than it is farther south. Perhaps this is due to the more intensive seasons in the North. I can recall one forenoon six swarms were out at one time. A few of the colonies were operated for section comb

production and the remainder for extracted honey.

The following little trick is worth knowing: He clipped his queens' wings. During the swarming season, he kept some small wire screen cages in his hip pocket and was ready to cage clipped queens as they left the hives when the swarms issued. He made his own cages. Wire screen was cut into pieces about four inches square. He simply rolled up each screen making it about one-half inch in diameter. He would then fold one end. When the queen was put into this cage at the time a swarm issued, he would then fold the open end in order to keep the queen in. He would place the caged queen in the top comb honey super, at the side of the follower board. He would then go through the brood chamber of the colony and destroy all queen cells but one, the best looking cell.

In due time, the virgin queen emerged from this cell and a few days later would mate and begin laying. The bees would feed the old queen above through the wire screen.

I tried out this method of handling swarms and it worked out well, just as the beekeeper said it would. This method has the advantage of keeping the colony undivided and naturally results in securing a maximum crop of honey also a young queen.

The old queen above, if she has not outlived her usefulness can be used for replacing a worn-out queen. I kept some of the old queens in supers above for two months. I did not suppose until I tried it, that the bees would continue to feed these queens for so long a time.

I should have said that during the time when swarms issue, I simply caged each clipped queen and pushed it into the entrance of her hive, then put a stick or stone on each hive to mark it until I could get around to examine the brood chamber. The swarms that are in the air very soon return to their hives when clipped queens are caged, then placed in hive entrances until they can be cared for.

When I have explained this method of handling swarms to some experienced beekeepers, they have sometimes expressed a doubt as to whether this procedure would actually prevent further swarming. As already stated, it worked well for me in Michigan. If some of you beekeepers try it out, especially in comb honey production, I would be glad to have you let me know how it works for you.

County Fair Exhibit by Weaver Apiaries of Navasota, Texas. Exhibit of honey combs from the foundation to the filled combs. Also the different flavors and colors of extracted honey. Results of pollination of crops by bees is also well represented. A complete beginner's outfit is displayed. The central feature is an observation hive of bees with a big dsplay of bottled honey in the background.

Fumagillin for Nosema Control in Package Bees

By C. L. Farrar, Madison, Wisconsin

Entomology Research Branch, Agricultural Research Service, U.S.D.A.*

NOSEMA DISEASE is the greatest single deterrent to the development of productive colonies from package bees. The disease causes more conspicuous losses in package colonies than in others because packages are started with small populations and have no young bees emerging for a period of three weeks.

There is no evidence that Nosema has become a problem because of package bees, but package bees present major problems because of Nosema. This protozoan organism is world-wide in distribution and restricts the production of all classes of colonies.

Nosema disease shortens the life of bees without producing behavior or mortality symptoms easily recognized under field conditions. Crawling bees are symptomatic of Nosema infections only during the first few days of a heavy flow. Prior to a flow more severe infections frequently occur without the bees showing abnormal symptoms. The heavily infected colonies, however, usually have less brood and show a subnormal rate of build-up.

The author has discussed the effects of Nosema in previous papers and suggested management practices that can be employed to minimize Nosema losses by both producers and users of package bees. The effectiveness of these practices may be greatly increased by the use of a new antibiotic.

Experiments with Fumagillin for Control of Nosema

Preliminary tests by Katznelson and Jamieson† showed that a new amoebicidal antibiotic, fumagillin, prevented the development of Nosema in caged bees. In the fall of 1951, shortly after Dr. Jamieson visited the laboratory and told of their experiments with fumagillin, we verified their results with a 2-gram sample supplied by the Upjohn's Laboratories.

In February 1952, in cooperation with the Abbott Laboratories, tests were undertaken to measure the therapeutic value of fumagillin, first with caged bees and later in the season with packages that had been inoculated with Nosema. All the results justified the conclusion that fumagillin might be used effectively for the control of Nosema. Fumagillin has proved to be a good therapeutic agent and nontoxic at the required concentration. Treated inoculated bees lived about as long as uninoculated controls and much longer than those inoculated but not treated. Furthermore, the antibiotic could be administered by common feeding practices employed in beekeeping.

The economic importance of the Nosema problem in the production and use of package bees stimulated large-scale practical tests based on these laboratory results. In the spring of 1953, 2,340 packages were made available for fumagillin tests by commercial beekeepers—four in Wisconsin, one in Iowa, and two in Minnesota. Much of the field work was done by Howard E. Cmejla* and Don F. Peer, research assistants at the University of Wisconsin; R. J. Walstrom, extension entomologist, Iowa State College; and T. A. Gochnauer, research associate (bacteriologist for bee diseases), University of Minnesota.

ONE PACKAGE producer in Louisiana supplied 520 packages purchased by the Iowa cooperator for testing three treatments in eight combinations. Otto Mackensen, E. Oertel, and Stephen Taber of the Baton Rouge Laboratory, and Wm. C. Rob-

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* In cooperation with the University of Wisconsin Agricultural Experiment Station and informal cooperation with the Iowa and Minnsota Agricultural Experiment Stations.

† Katznelson, H., and Jamieson, C. A., 1952. Control of Nosema disease of honey bees with fumagillin. Science 115 (2977): 70-71.

* Supported in part by the University of Wisconsin Research Committee from funds supplied by the Wisconsin Alumni Research Foundation.

Asked & Answered

What to Do with Combs of Granulated Honey

Question: I have about a ton of honey that has granulated in combs. How can I get the honey from the combs?—Harvard A. Fout, Ohio.

Answer: If you should put the combs of honey in a hot room in order to liquefy the honey, there would be some danger of melting the wax which liquefies at a temperature of approximately 143°F.

If you need some combs of honey for bee food this coming spring, you could save as many supers as would be necessary for spring feeding. Even though you would give each colony a few combs of this granulated honey, the bees would utilize it, especially when the weather turns warm. The temperature of the brood chamber, approximately 92°F., would tend to liquefy the granulated honey and make it available to the bees.

The most feasible suggestion we have to offer is to cut the combs of granulated honey out of the frames, into a metal container, or containers, then set these containers in a wash boiler with water, over a gas hot plate. The combs will eventually liquefy when a sufficient amount of heat is applied. After the combs are thoroughly liquefied, the gas is turned off. As the liquid mass of honey and wax begins to cool, the wax, being lighter than honey, will solidify on the surface, while the honey, being heavier than wax, will remain below. The cake of wax may be lifted off and the honey below may be heated enough to permit straining it through a fine cheesecloth, in order to remove any foreign matter.

You should secure quite an amount of wax from the combs, at least enough to help pay for comb foundation to put into the empty frames this coming spring.

* * *

Parentage of the Drones

Question: Please explain as fully as possible the statement that a drone has no father but has a grandmother on his mother's side.—Alabama.

Answer: A drone which is a male bee, has no father; but strange to say, he always has a grandfather (a maternal grandfather). There are three kinds or classes of bees that lay unfertile eggs from which drones are produced. The queen bee, after she has mated with a drone, lays two kinds of eggs, fertile and unfertile. The fertile eggs produce worker bees which are undeveloped females and the unfertile eggs produce drones or male bees—a clear case of parthenogenesis, or virgin birth. A virgin queen, one that has not mated with a drone, due to abnormal conditions, will lay only unfertile eggs which produce drones. When a colony becomes hopelessly queenless, due to the virgin queen being lost in mating, or to some abnormal condition, some of the worker bees will lay unfertile eggs which produce only drone bees. So these drones have no father but they do have a grandfather, on their mother's side of the house.

* * *

Shape of Honeycomb Cell

Question: Do bees make their honeycomb with six-sided cells regularly, or are the cells circular when first made? —Massachusetts.

Answer: The cells are six-sided when first made. Of course, when foundation is given to the bees the pattern is already made for the six-sided cells, but when the bees build comb without foundation the septum is laid out in advance for hexagonal cells, as may be seen by examining the lower edge of newly-built comb when comb-building is in progress. Some have argued that the cells are circular when first built and become hexagonal on account of being crowded together, but careful study of the building of the septum reveals that the cells are laid out in hexagonal form from the start. The coping on the surface of the comb at the outer end of the cells is slightly heavier at the angles, thus making the opening more nearly circular in form. This is sometimes mentioned as evidence that the cell was originally circular instead of six-sided, but the coping is apparently for the purpose of strengthening the comb instead of indicating the original shape of the cell.

Inspector Replies to Dr. Eckert's Ideas on Disease Control

Don't Coddle A.F.B.

By George W. Moore, Apiary Inspector, Shasta, Calif.

I READ WITH INTEREST Dr. J. E. Eckert's article on disease control that appeared in the December 1953 issue of Gleanings. The immediate question that came to my mind was, would it pay to treat the small amount of American foulbrood found in my area and run the risk of spreading the disease, or continue with the effective burning method?

In 1953 there was only .15 of one per cent of A.F.B., or less than ONE PER CENT infection, among colonies that were not moved out of Shasta County. Colonies that moved into the county in 1953 showed an infection per cent of 1.7, or less than TWO PER CENT.

What we have done in Shasta County can be easily duplicated by others. There are counties in California that are doing as well as we are, and then there are others that are doing little or nothing. The same probably holds true for other states.

Cites Experience

After 35 years as a bee inspector, I feel that many beekeepers are so careless that they cannot be trusted to treat colonies with A.F.B. Since the California burning law was passed in 1927, for example, beekeepers have been treating A.F.B. with little success.

While the writer was an inspector in Contra Costa County, a few colonies of A.F.B. were found in an apiary and the owner was notified to clean up (that was the law at the time). The owner was offered help to do the job but he refused it saying, that he WOULD BE CAREFUL and needed no help.

What happened?

After a few days I happened to pass by his apiary about 8 A.M., and there he was starting to load "shook" combs onto his truck with the diseased combs all exposed to the very active robber bees.

In view of this instance and many others that can be told, I cannot understand how anyone could recommend "treatment" for the control of American foulbrood. And, I might add, to me it seems impossible to prevent some of the chemicals from getting into some of the marketable honey.

Let's devote more time to breeding disease resistant bees and not run the risk of spreading foulbrood with the present treating methods.

Beekeepers are also Good Samaritans

Mr. and Mrs. Ted Manns of Oberlin, Ohio find that they have a lot of friends in the Lorain County (Ohio) Beekeepers' Association. These friends arranged for a surprise home furnishings shower for the Manns after the Associations' annual banquet because the Manns had recently lost all of their goods in a fire that thoroughly destroyed their home. At the time of the fire Mr. and Mrs. Manns were returning home from a visit to their children in Arizona. — Photo sent by Mrs. Alvon Roser.

FUMAGILLIN FOR NOSEMA

(Continued from page 109)

erts of the Madison Laboratory assisted him in the preparation of these packages, grouping the eight test lots and taking the necessary records and samples. One producer in Texas and one in Alabama added fumagillin to the syrup in some of their packages purchased by the northern cooperators.

Diagnoses of samples taken from the packages at the point of origin or on arrival and from the colonies three weeks later were made at Madison, except for those samples from 425 packages tested in Minnesota, which were diagnosed by Dr. Gochnauer. The author coordinated the project and assisted in the field work in all three States. John F. Long, C. D. Floyd, and F. B. Paddock, State apiarists of Wisconsin, Minnesota, and Iowa, respectively, rendered valuable assistance.

The cooperating beekeepers not only purchased the bees and the syrup fed but gave generously of their time and kept records beneficial to the success of the project. The Abbott Laboratories supplied the fumagillin and other special items, and assayed the sampled lots of syrup to which fumagillin was added.

Summary

The brief summary of these experiments is presented here so that those producing or purchasing package bees may have immediate opportunity for reducing the economic losses from Nosema disease. A full report of the experimental data will be presented later in a technical publication.

Normal food—honey and pollen in the comb—was supplied all packages by the cooperators. Approximately 10 pounds of fumagillin syrup was fed to half the packages under test. A solution of fumagillin in ethyl alcohol was added to sugar or honey syrup to provide 50 mg. of fumagillin per liter. Most of the treated packages received 172 mg. of fumagillin; there were a few exceptions where less syrup was fed. One cooperator who fed honey syrup added sulfathiazole as a preventive against American foulbrood. The sulfathiazole did not change the activity of fumagillin against Nosema.

About 30 per cent of the untreated packages received the same amount of syrup without fumagillin. All colonies were provided adequate reserve stores in the comb, and those fed syrup showed no effect of stimulation over those not fed. The syrup was supplied from pails or division-board feeders. A few colonies failed to take the syrup, either because the holes in feeder pails were clogged or because the cluster located on the opposite side of the hive from the division-board feeder.

The results of these tests are shown in table 1. The data are based on the diagnosis of mass samples of 15 to 20 bees taken from 1961 packages and from their respective colonies before the emergence of new bees three weeks later.

Table 1.—Incidence of Nosema infection in package colonies treated with fumagillin and in untreated colonies.

Level of infection	No fumagillin (Percent of 992 pkgs.)		Fumagillin (Percent of 969 pkgs.)	
	Initial sples.	3-wk. sples.	Initial sples.	3-wk. sples.
Negative	72.5	27.2	76.5	82.1
Light	17.7	21.6	16.9	15.7
Medium	8.5	24.7	5.0	1.7
Heavy	1.2	26.5	1.6	0.6
Total infected	27.5	72.8	23.5	17.9

The level of infection in the untreated colonies increased in three weeks from 27.5 to 72.8 per cent but decreased from 23.5 to 17.9 per cent in those treated. Of the untreated colonies 51.2 per cent were medium to heavily infected, compared with only 2.3 per cent among those treated. The infection in the treated colonies may be due to the bees' failure to take the syrup.

Shipments from 11 sources supplied the bees for 39 test apiaries. The packages tested in Iowa and Minnesota were received by truck, the others by express and parcel post. The Iowa packages were divided into eight groups of 65, each group having been shaken from colonies in a different apiary.

No information is available on the number of apiaries supplying the 425 packages used in Minnesota. Presumably each shipment received in Wisconsin was shaken from a different apiary. Table 2 gives evidence why different shipments from the same commercial source vary in their ability to develop productive colonies.

Table 2.—Infection in initial samples taken from package shipments.

Source	Percent of samples showing infection							
	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6	Lot 7	Lot 8
1	6	15	17	28	29	40	52	55
2	8	9	27	30	41	49	60	83
3	2	7	13	16	17	22	38	
4	12	18	27					
5	18	35						
6	22	27	37	43	62	89		

Fifty percent of the queens used in the packages tested in Iowa were produced in nuclei fed fumagillin syrup. Samples of bees were taken from 25 treated and 25 untreated nuclei when the queens were removed. No infection was found in samples from treated nuclei, but there was 87 per cent infection from the untreated, 43 per cent being heavily infected.

It was reported that the treated nuclei maintained normal queen production, but that many of those untreated had to be restocked with bees.

The majority of package queens lost after the packages were installed were not found for diagnosis. Twenty-seven Nosema-infected queens were recovered from all the test yards, but only one infected queen came from a treated colony and none of the 27 were produced in treated nuclei.

Packages shipped with fumagillin added to the syrup showed a slight advantage over those shipped with untreated syrup. This short treatment of three to five days during shipment was inadequate when the package colonies were not fed fumagillin after arrival.

All laboratory tests indicate that prolonged feeding of fumagillin is necessary for Nosema control.

Sufficient treated syrup is needed to supply the colony's principal food requirements for at least three weeks, or until there is a rapid emergence of young bees.

Production gains resulting from treatment are not easily determined in commercial apiaries. Most of the cooperators followed the acceptable beekeeping practice of rebuilding inferior colonies by adding brood and bees from stronger colonies.

According to one cooperator, "there was undeniable evidence that the yards included in the experiment were far ahead in honey production per colony over those not included. I would say that the average of those 13 yards against the average of the other 35 was better by 25 to 30 per cent."

Since only half the colonies in the experimental yards were fed fumagillin, the advantage indicated may be considered conservative. All 48 yards had 40 colonies established with packages from the same source.

Production Records Submitted

Three cooperators submitted production records or statements indicating an average of approximately 30 pounds in favor of the treated colonies.

One cooperator reported no difference, except in one yard where the initial infection was the heaviest of all test lots. He thought that the treated colonies in this yard might have shown 25 to 30 per cent greater production during the clover flow.

One cooperator reported that the untreated colonies produced more than the treated, but explained that drifting in the yard where the colonies were established, differences in honey flows at locations to which the colonies were moved, and European foulbrood infections made it impossible to draw any safe conclusion.

All operators but one were impressed by the differences in initial build-up between the treated and untreated colonies, and they thought fewer queens were lost in the treated ones. These impressions furnished by the cooperators appear significant because they agree so well with the diagnostic data.

Recommendation for the Use of Fumagillin

The most effective point of attack on Nosema with fumagillin seems to be the colonies from which package bees are shaken.

For the production of Nosema-free package bees, each colony should be fed the equivalent of at least two 10-pound pails (7 quarts) of fumagillin syrup during the four weeks prior to the shaking period. The treated syrup should be divided into two or three equal lots to provide a more continu-

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Just News

The **Worcester County Beekeepers' Association (Mass.)** is again sponsoring a Bee School for beginners to be held in Worcester Natural History Museum. Eight lessons will be presented by practical beekeepers. The first lesson to be held February 13, will be given by B. W. Richardson and will deal with necessary beekeeping equipment. The second, to be held February 27, dealing with honey production, will be led by Henry Poole.

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The **Michigan State Beekeepers' Association** will meet on Wednesday, February 3rd and Thursday, February 4th, 1954 during the Annual Farmers' Week Meeting at Michigan State College. Beekeepers will meet in rooms 103-104 in Kellogg Center. Dr. W. E. Dunham of Ohio State University and John W. Buchanan, sales manager of The A. I. Root Co., will be some of the several interesting speakers. All beekeepers are welcome.

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The annual winter meeting of the **Vermont Beekeepers' Association** will be held on Feb. 16, at 12:30 P.M., at the Country House Restaurant in Barre, Vermont. Following the luncheon, we will have the business meeting.

The top event of the program will be "History of Vermont Beekeepers' Association" by Judge H. William Scott. Judge Scott was secretary of the Association back in 1890 and has been active in the Association since. We will have other interesting speakers, as well as moving pictures of bees. Everyone interested in bees is invited to be with us at this meeting.—Clyde N. Wood, Sec.

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Middlesex County Beekeepers' Association (Mass.) has announced through President Chester McInnis, that Mr. John Proctor of Needham was appointed chairman for the 83rd Annual Bee Exhibit to be held at the Massachusetts Horticultural Society Flower Show in Boston, March 14th to 20th. The Annual Show has come to be recognized as "THE" Spring Show in the New England area where many tens of thousands of New England people will this year learn of the "Value of HONEY as a Food" which Mr. Proctor states will be the theme of the Show.

The next regular meeting of the Association is scheduled for February 27, at the regular winter home of the State Experimental Station in Waltham starting at 6:30 P.M. with a hot home-made buffet dinner. This is to be followed by a business meeting and the special committee will discuss the Show. It is expected that a well known authority will be present as a guest to talk on the theme subject.—John H. Furber, Sec.

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The winter meeting of the **Connecticut Beekeepers' Association** will be held on Feb. 20, at the Connecticut Agriculture Experiment Station, 123 Huntington St., New Haven. There will be a panel discussion on beekeeping. Lunch will be pot luck with the association furnishing coffee.—Philemon J. Hewitt, Jr., Chairman of Publicity.

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The **Southern Tier (New York) Beekeepers' Association** will hold its next meeting at 8 P.M. Tuesday, February 16, at the C. L. Reynolds Radio and Appliance Salesroom, 25-27 Sturges St., Binghamton, N. Y. A light lunch will be served. The speaker will be Mr. Ray Bentley of Dryden, N. Y. Mr. Bentley is considered an expert in the production of Card Honey. This should be of special interest to the smaller beekeepers. Due to unforseen circumstances Mr. A. E. Bolster will preside as president in place of Mr. Rubin Rood, for the year 1954.—Howard B. Webb, Sec.

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The **Cuyahoga County Beekeepers' Association** will hold its next meeting February 14 at the Miles Ave. Church of Christ, 9200 Miles Ave., Cleveland, Ohio. Mr. Walter Barth, Assistant Editor of Gleanings, will show NEW color slides on different phases of beekeeping.

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The **Westchester County Beekeepers' Association** will hold its next meeting

at 2:30 P.M. Sunday, Feb. 21st at the Odd Fellows Hall, 20 Lockwood Ave., New Rochelle, N. Y. All persons interested in beekeeping are welcome. Refreshments will be served at the close of the meeting.—Carlton S. Slater, Publicity.

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The **Crawford County (Kansas) Beekeepers' Association** met at the Chamber of Commerce rooms at Girard, Kansas, at 2 P. M., Sunday, Dec. 13, 1953 and held their annual election of officers. R. S. Snare, Cherokee, was e'ected president; M. F. Potter of 215 W. Buffalo, Girard, vice-president, and Herman Kaemmerling, 501 N. Osage, Girard, secretary-treasurer. Mrs. Vail Flint of Girard volunteered to be publicity leader.—R. S. Snare.

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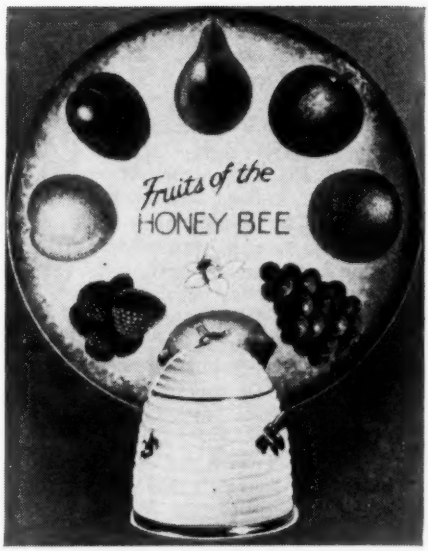
News of India and Pakistan

India.—To step up the production of honey in the Karwar District, the village industries Committees of the Karnatak Region has given an incentive to such producers by instituting prizes both at the District and Taluka levels to those who show the highest yield of honey from their beehives.

A decision to amalgamate the All-India Beekeepers' Association and the Indian Council of Beekeeping was reached at a joint meeting of the two organizations at Jaisalmer, House, New Delhi, under the presidentship of Dr. Panjabrao Deshmukh, Union Minister for Agriculture.

A swarm of bees literally stopped the "Rapido" express between Lisbon and Oporto when the switchman at Formoselha Station tried to throw the switch signalling "right of way" to the speeding train, the apparatus jammed and the express ground to an emergency halt. The signalman found a swarm of bees had turned the inside of the metal signal block into a hive.

Pakistan.—Mr. W. R. Howard, the British Apiary expert who surveyed Kaghan Valley in Hazara district, is of the opinion that Pakistan's honey resources could be the richest in the world if suitable methods were adopted for the development of this industry. During his tour, Mr. Howard was surprised to learn that the yield of honey per hive in Kaghan Valley was "three times that of the average Indian yield".



The honey plate and honey pot to be given as prizes at the Cook DuPage meeting.

The **Cook DuPage Beekeepers' Association's** annual meeting and banquet will be held Saturday afternoon and evening, February 20, 1954 at the Lawson Y.M.C.A., Chicago Avenue and State Street, Chicago, Ill. Afternoon speakers will be Carl E. Killion, Chief Inspector, Prof. V. G. Milun, University of Illinois; Dr. M. H. Haydak, University of Minnesota; Walter Barth, Assistant Editor of Gleanings.

Numerous door prizes will be given as a raffle—see the honey plate and honey pot shown above—for the benefit of the Association.

The evening session will be a panel discussion by the speakers of questions brought in by the beekeepers. Colored slides and movies, music, and entertainment. Dinner will be served at 6:30 P.M., $3.00 per plate. Make reservation early to A. J. Smith, 5835 W. 127th St., Worth, Ill. Phone Fulton 5-0153.—A. J. Smith, Sec.

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The **Franklin County Beekeepers' Association (Mass.)** meetings and picnics for 1954 are: Feb. 28, 2:30 p.m. Mr. Owen Stacey of South Vernon and Ralph Livernois, East Northfield, will lead a discussion on the subject of beginners in beekeeping at Mr. George Lukardt's place, 56 Pleasant St., 2:30 p.m., Greenfield, Mass.

March 28, 2:30 p.m. At Mr. George

Lukardt's place, 56 Pleasant St., Greenfield, a meeting and discussion on honey plants by Mr. Charles Johnson of West Deerfield and Mr. Owen Stacey, of South Vernon. Colored slides shown by Mr. Joseph J. Cummings of Greenfield.

April 25, 2:30 p.m. At Mr. George Lukardt's house and back-lot apiary, there will be a discussion by the Committee on swarm prevention. After the business meeting refreshments made of honey will be served.

June 12, 1:00 p.m. Picnic at the University of Massachusetts apiary, Amherst. Dr. Frank R. Shaw, University beekeeping specialist, will demonstrate methods and equipment for grading honey.

June 27, 1:00 p.m. A picnic at Mr. Elmer W. Lyman's apiary and home at Greenwich, N. Y. Mr. Lyman has a honey house worth seeing and the answer to success in beekeeping. Anyone interested in beekeeping is welcome to these meetings and picnics.

Officers of the Franklin County Beekeepers' Association are President, Frank Wyman, South Athol; Vice-president, George Lukardt, Greenfield; Secretary-treasurer, Joseph J. Cummings, Greenfield.

* * *

A Correction

GLEANINGS wishes to correct a statement made in our monthly column, "Bee Facts" for the January issue, Part 4 of "Weather Factors in Honey Production" should be changed to read as follows: "Over 58 per cent of the nectar was stored on days when the maximum daily temperatures were between 85 and 94 degrees F."

* * *

Leo F. Hannegan whose Hawaiian apiary suffered damage from Japan's attack on our country, as recorded in the July, 1943, Gleanings, died December 14 from a heart attack. He and his wife had come to the U. S. and lived in Florida and California. They were planning on returning to Hawaii when he was taken.

* * *

George Henry Kirkpatrick, Kalkaska, Michigan, passed on November 30 in his 95th year. Early in life he became interested in bees. For the past 30 years he operated an unusually attractive roadside honey stand at the edge of Kalkaska. Mr. Kirkpatrick was an honorary member of Michigan Beekeepers' Association.

* * *

New Book on Bee Behavior Available.—"The Behavior and Social Life of Honeybees" by C. R. Ribbands of the Bee Department of the Rothamsted Experimental Station in England, is a new comprehensive and carefully documented review of knowledge of the behavior and social life of the honey bees.

Designed to meet the needs of scientists, practical beekeepers, and naturalists alike, the book emphasizes recent scientific investigations that heretofore have been segregated to scientific journals.

This 352-page book, with 9 plates of photographs and 66 other illustrations, is written in everyday English, without scientific jargon. These factors together with a bibliography of more than 700 titles places this book among the great bee classics of modern times.

The book is now available through the Gleanings beekeeping library at the very nominal fee of $4.50 postpaid.

* * *

The officers of the Pennsylvania State Beekeepers' Association for 1954 elected at the annual meeting held at Harrisburg in conjunction with the annual Farm Show, January 12 and 13, are: President, H. K. Beard, R.D. 1, Sheridan, Pa.; Vice-president, Q. M. Minnich, Red Lion, Pa.; Secretary-treasurer, A. R. Dean, Pittsburgh, Pa.

The Pennsylvania Association was most fortunate in having its ten displays of honey and molded wax in the main lobby of the Farm Show Building where it is seen by all.

The Association is considering selling honey, honey ice cream, candles, etc., in a booth in 1955, the booth to be as near the honey display as possible. This year the Association celebrates its 50th Anniversary.

* * *

The **Los Angeles County Beekeepers' Association** will be host to all beekeepers of Southern California on an all-day trip through the San Dimas Experimental Forest, Saturday, February 20.

Bring your own picnic lunch and coffee will be provided. All ages of children will enjoy the trip, so bring them all along.

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 15c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceeding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA Honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 1.

Light amber honey, liquefied or granulated, sample 10c. Joseph Fekel, Vineland, N. J.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C. O. D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for your comb honey and all types extracted. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH for Beeswax. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WANTED—Light amber clover, amber, goldenrod, buckwheat. Advise what you have for immediate delivery. Roscoe F. Wixson, Dundee, New York.

WRITE FOR shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 percent saving. Walter T. Kelley Co., Clarkson, Kentucky.

CASH PAID for white and amber extracted honey. Send samples and state quantity available. Prairie View Honey Company, 12303 - 12th St., Detroit 6, Mich.

WANTED—Carloads or less of honey and wax. Any grade. Send sample and best cash price. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

ALL GRADES HONEY AND WAX WANTED—Mail samples, advise quantity and cash prices delivered to us. HONEY SALES COMPANY, 1808 NO. WASHINGTON AVE., MINNEAPOLIS 11, MINN.

CASH FOR YOUR HONEY—Light extracted or comb. Regular trade send sample. 60-pound cans furnished if desired. W. R. Moomaw, Stone Creek, Ohio.

BEESWAX OR HONEY WANTED in trade for supplies or cash. Hodgson Bee Supplies Ltd., 575 - 13th Ave., New Westminster, B. C., Canada.

WANTED — Honey all grades. Quote prices and send sample. Write Stoller Honey Farms, Latty, Ohio.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Co., Millersport, Ohio.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. A. I. Root Company of Syracuse, 1112-14 E. Erie Blvd., Syracuse, N. Y.

WANTED buckwheat honey. Eastern Food Products, 115 Division Ave., Brooklyn, N. Y.

HONEY WANTED; Large quantities. All grades. Cash price. Send samples. Finger Lakes Honey Co-op., Groton, N. Y.

WANTED—Light amber-clover and fall-flowers honey. Cloverdale Honey Co., Fredonia, N. Y.

WANTED—White clover and amber extracted honey, take all you have. State amount and price in first letter. We pay cash. Also for sale, one 1-inch stainless steel pipe coil flash heater, never used, $500.00; two 75-gallon honey tanks and stands, $20.00 each. Honeymoon Products Company, 39 E. Henry St., River Rouge 18, Michigan.

FOR SALE

WRITE FOR CATALOG — Quality Bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. K.D., 10 or more $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

ELECTRO Filling Machines, users and distributors. Write Stoller Honey Farms, Latty, Ohio.

BEE SUPPLIES—Tin packages; 10 sizes glass jars; paper shipping supplies; window cartons and other items. Roscoe F. Wixson, Dundee, N. Y.

The only comb foundation plant in the east. We sell foundation, work your wax, render combs and cappings. Robinson's Wax Works, R. D. 3, Auburn, N. Y.

FOR SALE—Modern Honey Processing and Bottling business, stainless steel equipment, capacity 5 to 10 million pounds per year. Location ideal for source of supply, excellent market. Sales force, plant personnel, inventory, copyrights, good going business, 12,000 foot floor space. Low lease rental, excellent shipping including side track. Owner is retiring. Write Box No. 154, Care of Gleanings, Medina, Ohio.

FOR SALE — 500 10-frame extracting supers, good combs. Joe C. Weaver, Everton, Mo.

FOR SALE—Root's hives, supers, equipment for extracting. Inspected. Write for prices. F. A. Fish, Lucca, N. D.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries, Waban, Massachusetts.

FOR SALE—250 10-frame comb honey supers, complete, $1.00 each. No disease. Louis Rummel, Poughkeepsie, New York.

TWIST BEE SUPERS No. 1. Grade supers No. 2. Write for prices. S. E. Twist, 201 Alpha St., San Francisco 24, Calif.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for certificate of inspection as a matter of precaution.

THREE-BANDED ITALIAN bees and queens of our regular strain. Also Dadant's new four way Hybrids for 1954. Alamance Bee Company, Graham, N. C., Phone 4703.

CAUCASIAN Bees and Queens. Write for 1954 prices. Lewis & Tillery Bee Co., Greenville, Ala.

ITALIANS—Packages, Queens. Martz, Rt. 2, Box 846, Vacaville, California.

YELLOW ITALIAN BEES. Real producers. Health certificate. Satisfaction guaranteed. 2 lbs. with queen, $3.70; 3 bs., $4.70; 4 lbs., $5.70; queens, $1.20. O. E. Brown, Route 1, Asheboro, North Carolina.

WANTED TO BOOK several hundred packages of bees with Queens to be shipped April 1st to 15th. We have a thousand hives to shake. Write for prices. Miller Bros., Safford, Alabama.

GOOD QUEENS AND PACKAGE BEES. Three banded Italians only. Used by leading beekeepers for more than thirty years. Tops in production and gentleness. No disease. Prompt shipment. Queens, $1.20 each; 25, $1.10 each; 100, $1.00 each. 2-lb. pkg. with select young queen, $3.75 each; 25, $3.50 each; 100, $3.25. 3-lb. pkgs. $1.00 each more. If shipped by parcel post, postage to be added. Lower prices after May 20. H. C. Short, Fitzpatrick, Ala.

FOR SALE—50 or 100 colonies bees in fine condition, ten and eleven frame hives. Dr. William C. Wilson, St. Charles, Mo.

HONEY LABELS
Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

Booking orders now. Over 30 years a shipper. Send for Free Circulars.
BLUE BONNET APIARIES
Weslaco, Texas

Package Bees & Queens
Quality & Service
C. F. KOEHNEN & SONS
Glenn, California

Stop! Look! Order!
Your package bees and selected queens
Good quality Italians
Dependable service
JOE PENCIN
Box 517 Davis, California

Booking Orders for 1954
RENEE Brand **Queens**
SILVER HIVES APIARIES
Enterprise, Florida
Write for Prices

Italian Queens & Packages

	1-24	25-99	100-up
Nice large qns.	95c	90c	85c

Write us for early queens and prices on packages.
Mitchell's Apiaries
Bunkie, La.

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

CAUCASIANS
CARNIOLANS

Hardy, prolific, rapid build-up, finest of workers, GENTLEST OF ALL RACES. GENTLENESS saves time, sweat, patience, work; safest in towns near neighbors or near highways. Farthest south of any queen breeder in U. S. Need queens real early? Write.

Untested queens, $1.20 each,

Air Mail

Discount on quantity orders. Ask. Some packages yet. Ready February 15th. Over 26 years a queen breeder.

Albert G. Hann

LaBelle, (south), Florida

CAUCASIAN

Package Bees

and

QUEENS

Howard Weaver

Navasota, Texas

QUALITY BRED ITALIAN QUEENS

March 10 to June 1 $1.00 each

June 1 to Nov. 1 .50 each

All queens shipped Air Mail and guaranteed to please.

Walter D. Leverette Apiaries

Fort Pierce, Box 364, Florida

GIRARDEAU APIARIES

Tifton, Ga.

Shippers of
Italian Package Bees
and Queens

FOR SALE: Twenty colonies of Italian bees. Inspected. Also supers, drawn frames, and other equipment. Price reasonable. C. A. Divelbiss, Lexington, Ohio.

FOR SALE—47 colonies complete with equipment, also enough equipment for 50 more. Elden Potter, 2115 Alpha Street, Lansing, Michigan.

100 two-story colonies bees, metal covers. State inspected at time of sale. The Hubbard Apiaries, Manufacturers Bee Supplies & Comb Foundation, Onsted, Michigan.

40 COLONIES, food chambers, and three supers. MOREHOUSE BROTHERS, Montevideo, Minnesota.

500 Colonies bees for lease or sale. G. C. Walker. Pharr, Texas.

FOR SALE—400 10-frame colonies of bees at Blackfoot, Idaho, with equipment for over 500. Cozy Nook Apiaries, 313 W. 138 St., Hawthorne, Calif.

FOR SALE—20 colonies of bees, Root extractor and combs, also comb honey supers and new supplies. F. J. Armstrong, 230 W. Atwood St., Galion, Ohio.

HOLLY-LINN APIARIES, Dayton, Texas. Well established business, good record of honey production, 950 standard 10-frame clean colonies. Best southern locations, modern extracting and packing plant. Large storage area. Mrs. Tyra Fulton, Trinity, Texas.

FOR SALE OR TRADE—Morgan Apiaries, located at Brooks, Alberta, on the new paved Trans-Canada Highway. All or part of 1200-colony outfit complete. Located in the center of a vast irrigated area famous for its No. 1 extra white clover honey. No dark honey produced and no crop failures in the last 23 years. My best year was a net yield of 363 pounds per colony spring count for complete outfit. Average annual production, 75 to 100 tons. Will sell bee equipment for one-half price and rent or trade land and buildings and new house and farm for California real estate. Will supply high production queens and teach the new owner the very necessary "**Know How**" from my 43 years of experience.—C. Elmer Morgan, 118 W. De La Guerra, Santa Barbara, Calif.

SEEDS

Flowers you will like—the bees will too. For your planting this spring, select trees, shrubs, unusual perennials which suit your purpose well and are best nectar plants. Send now for most complete HONEY PLANT catalog, free. Illustrated actual photos. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

Bargains in new or used honey cans or Root Supplies for cash or honey. Buckeye Honey Company, 3930 N. High St., Columbus 14, Ohio.

SECTION COMB HONEY production steps—$1.00. Comb Honey Production Glossary—50c. United Industries, Dept. L, Box 449, Madison 1, Wis.

WANTED—200 colonies bees to complete pollination contracts. Bee Pollination Service. Mays Landing, N. J.

WANTED: Bees and equipment in vicinity of Beckley, W. Va. Write price. E. P. Cochran, Prosperity, W. Va.

WANTED—800 two and three pound packages of bees for middle of April. Box 24, Gleanings, Medina, Ohio.

HELP WANTED

HELP WANTED — Two men for the coming season. Give references. Howard Weaver, Navasota, Texas.

WANTED experienced beekeeper for 1954 season or permanent position. Apartment included. J. Farr, 4851 Paddock Road, Bond Hill, Cincinnati, Ohio.

EXPERIENCED YOUNG MAN in extracted honey production. Give age, qualifications, salary expected. Season April-December. Board, room furnished. Lavern Depew, Auburn, N. Y.

WANTED—Reliable, experienced beemen. C. H. Schader, Sunnyside, Wash.

HELP WANTED. Experienced well in commercial beekeeping. Sober and industrious worker. Tenant rooms furnished if married. $300.00 per month. Gleanings, Box 254, Medina, Ohio.

WANTED—Beekeeper to operate 250 colonies on shares. Pollination and honey. Joseph Fekel, Vineland, N. J.

WANTED—Two men to work in our plant and apiaries. Excellent wages, opportunities for advancement, bonus, other benefits. Experience not essential. Schultz Honey Farms, Ripon, Wisconsin.

MAGAZINES

THE BEE WORLD international and scientific journal on bees and beekeeping, with apiculture abstracts. Monthly, including membership in the Bee Research Association, $3.00 per annum, including apicultural abstracts. Dr. Eva Crane, Director, 55 Newland Park, Hull, Yorks, Eng.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

ARCHIVE OF BEE SCIENCE (Archive fur Bienenkunde), oldest scientific, independent bee journal in the world. Select feature material gives lasting theoretical and practical knowledge. Sample copies available. Two large 1953 editions for the low price of DM 5.50. Biene-Verlag (Bee publishers), Lindau (B), Postscheck Karlsruhe 55811, Germany.

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarh Dist. Naini Tal, U. P., India, or available through them. Subs. Rs7/ or 10 shillings or 2.25 dollars per annum. Single copy Rs ¼s. 1/9 or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

INTERESTED in Angora Goats? Read the Sheep and Goat Raiser, Hotel Cactus, San Angelo, Texas, the only ranch magazine published serving the Angora Goat industry. Subscription $1.00. Sample copy fifteen cents.

GRAY CAUCASIANS
Quality Bees
and
Dependable Service
Write for Prices
BOLLING BEE CO.
Bolling, Ala.

Get More in 1954
Use PACKAGE BEES with Island Hybrid Queens

We plan larger and better production of 4-way Hybrid queens in '54 for package bees.
Place your order early for favored dates and delivery.

Prices with Island Hybrid Queens

	2-lb.	3-lb.
1 to 25	$3.65 ea.	$4.65 ea.
26 or more	3.40 ea.	4.40 ea.

For regular queens deduct 25c per package. Write for prices on early Booster Bees.

"They Produce"

Rossman Apiaries
P.O. Box 133, Moultrie, Ga.
Phone: 755R

PACKAGE BEES
FINE ITALIAN STOCK
Early shipment, by Parcel Post, Express or truck.

		10-up
2-lb. with queen,	$3.25	$3.15
3-lb. with queen,	4.10	4.00

Inquiries solicited.

Crenshaw County Apiaries
Rutledge, Ala.

PLANT'S
3-Banded Italians

2-lb. pkg. with qn.	$3.50
3-lb. pkg. with qn.	4.50
Queens	1.10

Discount on large orders.
Add $1.00 per lb. for larger packages.

W. E. PLANT
Hattiesburg, Mississippi

JENSEN'S

Bees and Queens will do a good job of producing honey, or pollinating for you. The superiority of Dadant's "Starline" stock of improved Hybrids is well established. Our "Magnolia State" dark 3-banded Italians continue year after year in universal favor. Use Jensen reared queens and cut supersedure losses to a minimum.

Reg. U.S. Pat. Off.

"Magnolia State" Dark Italians	Queens	Dadant's "Starline" Hybrids 2-lb. pkgs. w/q	3-lb. pkgs. w/q
1-24	$1.25	$3.75	$4.75
25-99	1.15	3.50	4.50
100-999	1.05	3.25	4.25
1000-up	1.00	Truck loadings by special arrangement. Contact us.	

All above prices are for regular Italian stock. For queens of Dadant's stock "Starline" 4-way Hybrids add 25c each. All Hybrid Queens clipped and marked. Italians on request only.

JENSEN'S APIARIES MACON, MISS. U.S.A.

"Little's Bees Know How To Winter, And Build Up Just Right In The Spring"
—H. T. M. Boise, Idaho

	1-9	10-99	100-up
2-lb. pkg. with young laying queen	$3.75	$3.50	$3.25
3-lb. pkg. with young laying queen	4.75	4.50	4.25
4-lb. pkg. with young laying queen	5.75	5.50	5.25

Extra queens (any number) $1.25 each.

Add 25c to above prices for Starline Stock.

We guarantee safe arrival, a health certificate with each shipment, and prompt service.

Reg. U. S. Pat. Off

Our Queens are reared under my own personal supervision, our aim is QUALITY NOT QUANTITY.

LITTLE'S APIARIES P.O. Box 122 Shelbyville, Tennessee

FUMAGILLIN FOR NOSEMA

(Continued from page 113)

ous supply. A heavy syrup (2:1) is better than thin syrup.

Fumagillin should be included in all the syrup fed to queen-mating nuclei. Not only will the young queens receive protection before shipment, but the small population of nuclei will receive protection against abnormal mortality. This treatment should materially reduce the amount of labor and extra bees needed to keep the queen nuclei in full production.

Beekeepers who use packages should feed fumagillin syrup when the colonies are established. The equivalent of a 10-pound pail of syrup is recommended. Several years of experience in the use of fumagillin may be needed before producers can guarantee Nosema-free package bees.

A new salt of fumagillin has recently been tested which is approximately twenty times more soluble than the fumagillin used in the earlier tests. It

(Continued on page 124)

J. E. WING & SONS
41 Years Continuous Service
Italian Package Bees and Queens
Our Specialty
Knights Landing, Calif.

Northern California young package bees and queens. Write for prices stating number of packages and date. Experienced shipper.

M. E. BAKER
Rt. 1, Box 202 Gridley, Calif.

ITALIAN QUEENS
of the Geo. W. Moore strain, personally raised and purely mated. Ready April 1st. $1.00 each. Quantity discount.
Hanson, Hall Bee Co.
Livingston, Alabama

York's Package Bees and Queens for 1954

Quality and Service

Your Choice of Two Outstanding Strains

Quality Bred Dadant's Starline 4-Way Hybrids
Quality Bred Italians

The Preference of Leading Honey Producers

7,500 colonies

DADANT'S STARLINE HYBRIDS

Reg. U. S. Pat. Off.

Quantity	Packages with Italian Queens 1-24	25-99	100 up
2-lb.	$3.75	$3.50	$3.25
3-lb.	4.75	4.50	4.25
4-lb.	5.75	5.50	5.25
5-lb.	6.75	6.50	6.25
Queens	1.25	1.15	1.05

Above prices are for/or with our regular line Italians. For DADANT STARLINE 4-WAY HYBRIDS add 25c each additional. For TESTED QUEENS add $1.00 each additional. For QUEENLESS PACKAGES deduct $1.00 per package.

Shipments are made by express, parcel post, or your truck. Detailed shipping information available. Trucks loaded from 7,500 colonies in a minimum of time. Fast service on queens from 7,000 nuclei. BOOKING ORDERS NOW for choice shipping dates.

York Bee Company, Jesup, Georgia U.S.A.

(The Universal Apiaries)

THREE-BANDED ITALIAN
Package Bees and Queens

SHIPPED ANYWHERE
in United States and Canada

1954 PRICES
DELIVERED PREPAID

	Queens (each)	2-lb. & qn.	3-lb. & qn.	4-lb. & qn.	5-lb. & qn.
1 - 24	$1.10	$4.00	$5.00	$6.00	$7.00
25 - 99	1.00	3.75	4.70	5.65	6.60
100-499	.95	3.50	4.40	5.30	6.20

(For queenless packages — deduct price of queen.)

Guaranteed safe arrival.
Health Certificate with each shipment.
Queens clipped and painted if desired.
Shipper rated in Dun & Bradstreet.

TERMS: One-third with order balance 10 days before shipment.

H. C. BRUNSON

P. O. Box 188 Phone: 4641
Hampton, South Carolina

INDIANA BEEKEEPERS

Be sure to get our 1954 Bee Supply Catalog, which will soon be ready.
We have the finest Package Bees and Queens. Order now.
Open every day except Sundays and Holidays.

A. I. Root Co. of Indianapolis
121 No. Alabama Street
Indianapolis 4, Indiana

ITALIAN BEES AND QUEENS

2-lb. package with queen $2.75
3-lb. package with queen 3.50
Queens each ..... .80

Book early and be sure of your shipping dates. 10% will book orders, balance 10 days before shipping date. Live delivery guaranteed.

BAYOU BEE CO.
Rt. 1, Box 49 Montegut, La.

GOOD ITALIAN QUEENS

In Season — Write

White Pine Bee Farms Rockton, Pa.

New Improved 4-Way Dadant Starline Hybrid Queens—and Our OWN QUALITY 3-Banded Italian Bees & Queens

Book NOW (subject to probable slight downward price adjustment.)

	Italians	Starlines	2-lb. w/q	3-lb. w/q	4-lb. w/q
1 -24	$1.20	$1.50	$3.50	$4.45	$5.40
25 -99	1.15	1.40	3.35	4.30	5.25
100-up	1.05	1.30	3.25	4.20	5.15

Reg. U. S. Pat. Off.

When Starline Hybrid Queens desired with packages, add 25c per package extra.

Queens clipped and/or painted if desired without charges.

GARON BEE COMPANY **Donaldsonville, La.**

27 YEARS A SHIPPER * * QUALITY AND SERVICE

5 EXPERIENCED MEN ON THE JOB 52 WEEKS A YEAR.
All have been connected with us 4 years or longer.
Lots of experience in loading trucks.

DARK ITALIANS AND ISLAND HYBRIDS

	Queens	2-lb. pkgs. w/qs.	3-lb. pkg. w/qs.
1 to 24	$1.20	$3.75	$4.75
25 to 99	1.10	3.50	4.50
100	1.05	3.25	4.25

For marked ISLAND HYBRID queens, add 10c
For truck loads, write. Book your order early. No deposit required.

WEAVER APIARIES **Navasota, Texas**

LIVE AND LEARN

(Continued from page 103)

off the top tarpaper and burlap, and refilling is a cinch if it is necessary.

If you have to feed sulfa, you may have to do a little differently. This dry sugar feeding is primarily intended to supplement short winter stores when you can't get at the bees to feed them. It works in the spring too, but the bees leave it a lot faster than they do the syrup, which may be good and may not be good. Some beekeepers have found ways of using sulfa by spraying the combs, or other variations. Personally I have never had to feed sulfa as a medicine, but in the spring when starting packages or feeding colonies that are low I generally put some in. This is done as sort of insurance, because it costs practically nothing, does no harm, and if there is anything in the hive that shouldn't be there, at least I have done what I could to knock it out. I do it for somewhat the same reason that I pack my colonies. Whether or not it does do good, it makes me more comfortable.

NORMAN BROS.

QUALITY BEES
DEPENDABLE SERVICE

Full weight, safe arrival, health certificate, and satisfaction guaranteed.

33 years as shippers.

— PRICES —	1-24	25-100
2-lb. pkg. with queen,	$3.00	$2.75
3-lb. pkg. with queen,	3.75	3.50
Untested queens	1.00	.90
Tested queens	2.00	1.75

Package bees are shipped express f.o.b. If wanted shipped parcel post, add postage.

NORMAN BROS. APIARIES
RAMER, ALA.

THE AUSTRALASIAN BEEKEEPER

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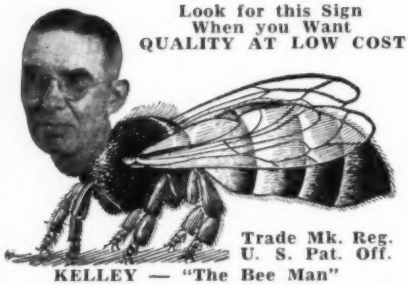

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100-up	.95	3.00	4.00

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FUMAGILLIN FOR NOSEMA

(Continued from page 121)

has the same antibiotic activity as the other fumagillin; is nontoxic at the concentration required for Nosema control, and has adequate stability in sugar syrup. It appears to have even greater stability in dry form than the previous fumagillin. This more soluble fumagillin has a distinct advantage for commercial use.

The dosage used in these tests, 50 mg. of active fumagillin per liter, equals 189.3 mg. per gallon of 172 mg. in a 10-pound pail of syrup (about 3.5 quarts). Actually, beekeepers who use fumagillin will not need to make these precise measurements. It is expected that this new salt may be available in tablet form for the producer who operates a few colonies, and in packets of powder suitable for mixing with 50 or 100 gallon lots of syrup for commercial users. Thus, the beekeeper would simply mix the contents of a package into the prescribed amount of syrup.

Sound management practices must not be neglected when therapeutic agents are used in direct attack on the disease-causing organism. Package colonies must have productive queens, adequate reserves of pollen and honey, and good combs providing ample space that is properly organized.

* * *

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Queens, ... 1.00 each

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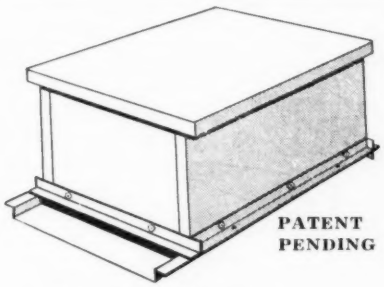

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Pounds	5	10	25	50	100
Mixture Brewers' Yeast and Soy Flour	$1.25	$2.40	$5.00	$9.00	$16.00
Brewers Yeast	1.50	2.75	6.00		
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Full weight, prompt shipment, young bees. State health certificate with each shipment. Live arrival guaranteed. Replacement or refund made promptly upon receipt of bad order from your express agent.

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Each Package with a Young Laying Queen

Lots of	2-lb.	3-lb.	4-lb.	5-lb
1 - 29	$3.25	$4.00	$4.75	$5.50
30-100	3.00	3.75	4.50	5.25
100-up, each	2.80	3.50	4.25	5.00

Tested Queens $2.00 each **Untested Queens $1.00 each**

For introduced queens, add $1.00 per package. If queenless bees are wanted, deduct $1.00 from the price of each package.

JACKSON APIARIES **FUNSTON, GEORGIA** **U. S. A.**

ROYAL JELLY

(Continued from page 77)

not the vitamins or hormones or both in Royal Jelly that produce the beneficial effects, but rather a property as yet undefined and analyzed that has the ability to stimulate and rejuvenate the glands of our bodies.

Reports given to this author by two people, unknown to each other, to the effect that when too large doses had been taken they became dizzy indicate that there is a potent element in Royal Jelly that may prove to be very important Consequently I think it well to give this to the American honey industry as a preliminary report in the anticipation of perhaps greater things to come.

Package Bees for 1954

Customers—I will head your packages with either strain of queens—Italian, Caucasian, or D. R. They are gentle to work with, slow swarmers, and rate among the best in honey production. Full weight packages and health certificate furnished with each shipment.

— PRICES —

	1-24	25-50	100 up
2-lb. w/q	$3.00	$2.90	$2.85
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4-lb. w/q	4.85	4.75	4.65
Queens	1.00	.95	.90

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BEES
and QUEENS

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18-99	1.05	3.10	4.05
99 or more	1.00	3.00	4.00

CALVERT APIARIES CALVERT, ALABAMA

3-BANDED
Italian Bees & Queens
2-lb. pkg. bees with queen, $3.00
3-lb. pkg. bees with queen, 4.00
Extra queens, ... 1.00
J. P. CORONA
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4-lb. pkg. with queen 3.90
5-lb. pkg. with queen 4.75
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THREE-BANDED
QUALITY SUPREME
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National Monthly Magazine
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Canadian Bee Journal
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only $1.75 per year.

BEE FACTS

(Continued from page 95)

preceding one and before a fatal reaction can occur, there would probably have had to be at least one milder reaction to a sting.

Subjects who show such hypersensitivity to bee stings should be desensitized by injections of extracts prepared from the body of the bee, which are available commercially. When stung, hypersensitive subjects require immediate treatment including intravenous epinephrine, oxygen administration, tracheotomy if required and intravenous fluids to counteract shock.

Reference: Schenken, J. R., Tamisiea, J., and F. D. Winter. Hypersensitivity to Bee Sting. Am. J. Clin. Path. 23:1216. Dec. 1953.

PACKAGE BEES ..... "GULF BREEZE" ..... QUEENS

Check our eight-point offer and place your order with us promptly.

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25-99	1.10	3.25	4.15	5.15
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Prompt shipment, baby bees.

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1-9 ..... $1.10 each
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Geo. W. Moore
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Order now—no deposit required

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Do You Have Idle Equipment?

We extend credit without charge to commercial beekeepers who use 100 or more packages. Our price in quantities of 100 or more, for a 2-lb. package with a young laying, Bambi brand queen is $3.25 and the 3-lb. package with a young laying, Bambi brand queen is $4.25. Prices are f.o.b. Our newly designed shipping package gives better ventilation and fewer bees die in transit. We also extend credit, without charge, on order of 100 or more Bambi brand queens at $1.00 each. If interested, please send three character references; the number of packages or extra queens wanted; the shipping date; and as soon as we have had the time to check your references, you will immediately be advised if we are in a position to fill your order. Ask your neighbor about our Bambi brand queens.

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Chatom 1, Alabama

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They will pay you good rent. We start shipping April 1st.

		50 or more
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3-lb. pkgs. with queens,	4.00 each	3.60
Untested queens, ...	1.00 each	.90
Tested queens, ...	2.00 each	1.75

Package prices F.O.B. shipping point.
Queens delivered by mail.

Our 42nd year with the bees means you get good quality and service.

Merrill Bee Company

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